American Aviation

MANAGEMENT
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PRODUCTION
OPERATIONS
MAINTENANCE
EQUIPMENT

SEPT. 28

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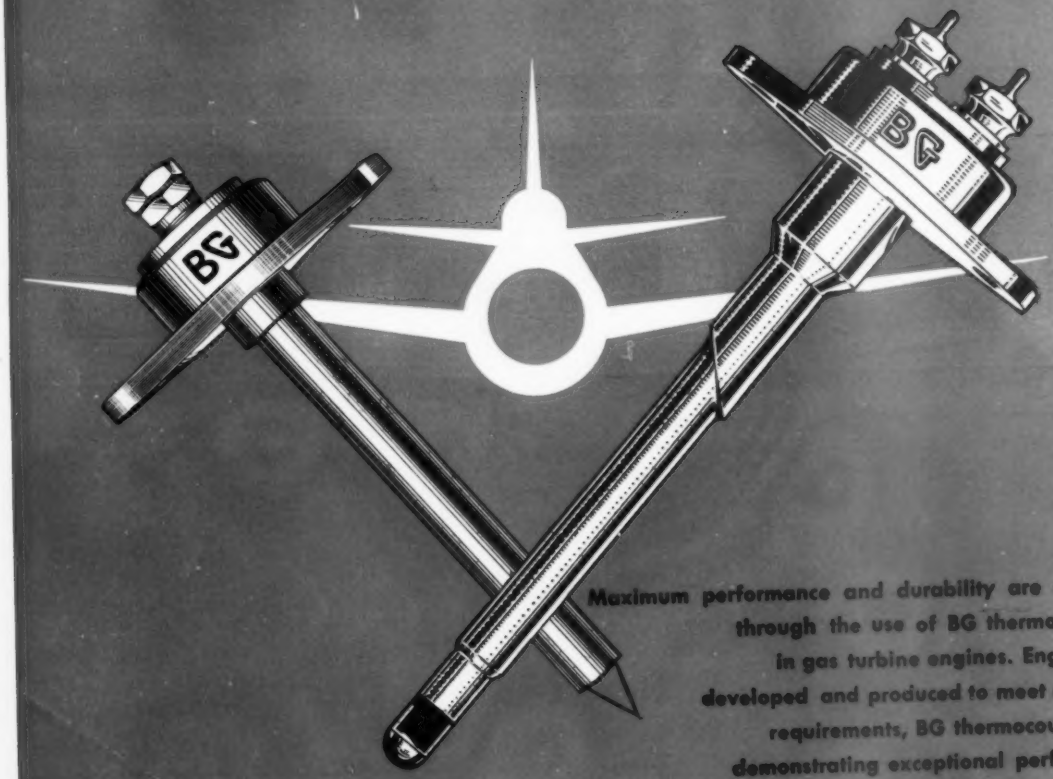

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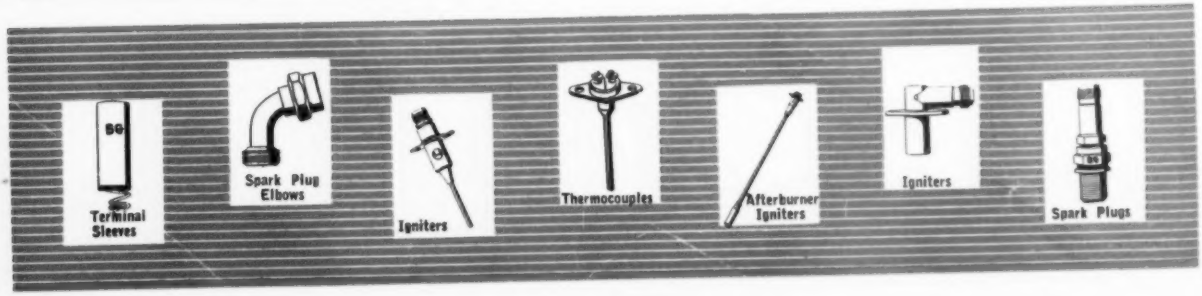

Two U. S. airlines—one domestic and one international—have reportedly ordered a total of seven Boeing 707 jet transports for accelerated test purposes, with option to buy more for fleet purposes.

This would tend to discount earlier talk that turboprop transports would precede turbojets. Latest figures, incidentally, show that U. S. has accumulated 5.6 million flying hours with jet engines (more than 2 to 1 lead over Britain) against only 500 hours with turboprops.

•

Government's program of allowing five-year tax write-offs on manufacturing plants and facilities and new airline planes will probably end soon.

Manufacturers have used the program much more than airlines, for obvious reasons—a new plant can be written off in five years instead of 20 to 25, whereas writing off a new airline transport in five years isn't much different than using the normal seven-year period.

Government's goals in the program were $1.3 billion expansion in manufacturing facilities, and approval of 600 airline planes. So far, manufacturing approvals are over $1 billion, but only 377 transports are included.

•

Administration plans for submitting an airways user charge proposal to Congress early next year may bring growing pressure from some quarters to turn airways over to private operation.

Controversy hinges on whether CAA's $85 million annual budget for airways operation and maintenanace isn't double that which private industry would require. Even if airways remain with CAA, look for insistence by users on a better accounting of expense.

Military services, which have remained silent on user charge issue, would probably block industry operation. But silence is more attributed to military desire to establish its own airways eventually—a hope somewhat stymied by present Defense policy of not duplicating other agency activities and more surely prone to investigation by Congressional appropriations committees.

•

Local service airlines, virtually abandoning hope for production of any "DC-3 replacements" in the near future, are turning to schemes that promise to step up block speeds of current DC-3's.

Studies by a local service consultant show that one mile per hour increase in air speed would cut DC-3's direct operating cost by $1000 annually. Improvements in the order of 50 mph, said to have resulted from modifications made for corporate users of DC-3's, could reduce local lines' costs by millions a year.

Death blow to Canadair CL-21, long considered the most promising DC-3 replacement, was dealt in large part by another consultant's report that U. S. market for such a plane was about 60 between now and 1960. Actually, local service fleet has grown from 120 to 156 in past 12 months.

The Washington View

The Investigation Stockpile

In their eagerness for investigations, the Republicans have, unfortunately, on occasion wound up stumbling over one another. Lately Sen. Styles Bridges (R., N.H.) indicated that it might become necessary for his Senate-Appropriations Committee to delve into the national defense stockpiling program which is of vital importance to the aircraft industry. There had come to his attention, he said, reports of serious irregularities. However, while Bridges is having the reports checked, Sen. George Malone (R., Nev.) apparently has stolen a march on his colleague. Malone, who is chairman of a Senate Interior subcommittee, has started his own probe.

Nest Egg for '54

Major effect of the recent Pentagon cutbacks in Air Force and Navy aircraft and engine procurement has been a total of $2 billion saved overall. This means, presumably, that for next year's Defense budget there will be an additional $2 billion in unobligated carryover in aircraft and related procurement. Consequently. Defense Secretary Charles Wilson can cut an equivalent sum in new money.

Such a course would seem to be in the cards. It would be in full compliance with Budget Bureau Director Joseph Dodge's directive for further tightening up all along the line. For the coming fiscal year Dodge has said the total budget is to be substantially less than this year's. Again, the brunt of the cut will fall on the military. Some reports indicate as much as $5 billion may be lopped off. Wilson will still have a long pull, but he has that $2 billion of it tucked away.

CAB Takes a Siesta

The latest block in efforts to invalidate former President Truman's termination of the U. S.-Mexico air permits of Braniff, Eastern, and Western a year ago has come from an unexpected quarter, the CAB. To date the Board has failed to comply with a request from the Justice Department for a brief on the matter. Justice, some four months ago, solicited comments from all interested parties, which includes CAB. An opinion was to be rendered on the legality of Truman's action on the Mexican permits. All three carriers have returned answers and it is known that one was prepared at CAB. Board chairman Oswald Ryan, however, has not approved it.

The Illegal Mind at Work?

The present status of the North American Airlines court fight with CAB finds the non-scheduled group in a unique position. Contending that CAB's regulations are invalid, North American has said there has consequently been no violation. Yet recently when pressed, the group's attorney, Hardy Maclay, made a strange admission in the District Court, Washington, D. C. In response to a question from the bench he replied that " . . . it is perfectly obvious that if the regulations under which they [the CAB] are prosecuting us do apply, then we will be revoked because then we are violating." Maclay added, "We are not operating under the regulations the way they are in effect today, because we can't operate under the regulations; the entire organization will go out of business."

Search Pattern

The Air Transport Association's search for a new president to succeed Emory S. Land has taken on all the aspects of becoming a perpetual quest. ATA's Selection Committee for a presidential candidate first met annually and without producing any result. They are now moving a little faster, meeting on a quarterly basis, but with the same indecision. Their latest get-together earlier this month failed again for lack of agreement. At that time, Erle Cocke was the most prominently mentioned as being under consideration as Land's successor. Cocke, who is assistant to Delta-C&S Air Lines' president, C. E. Wolman, is a past National Commander of the American Legion. Included among those who have also been mentioned to head ATA, if Land does go, are Stuart G. Tipton, ATA general counsel; Ray Ireland, UAL vice president-traffic; and Jennings Randolph, ass't to the pres. of CAP.

User Charges and Counter Charges

Careful attention and study are merited by Dr. Beatrice Aitchson's Federal User Charges Study. The much maligned report—Commerce Under Secretary for Transportation Robert B. Murray branded it as "a year's waste of time"—has finally been informally released. Immediate reaction was most favorable. A thorough reading by all interested parties should be a must. They can get an insight into what's in store for them. For it's a good bet the report won't be wasted.

But why was the report slammed so hard? There are at least two good reasons. The first is a simple one: Murray wouldn't buy it because it was initiated by the last administration. The other reason is more subtle: It arises from internal dissension in the Department. According to this theory, Dr. Aitchson was dropped and her report was damned on personal bias.

. . . Preble Staver

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OTHER PUBLICATIONS . . .

American Aviation Daily, a daily news service for the entire industry. $200 per year. Managing Editor: Keith Saunders.

American Aviation Directory; twice yearly listing of products, people and organizations. $7.50 each. Managing Editor: Marion E. Grambow.

Official Airline Guide: Monthly publication of airline schedules and fares. $13.50 per year in USA and countries belonging to Pan American Postal Union, including Spain and the Philippines. $15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

American Aviation Traffic News incorporating Air Tariff Reports): Daily rates and tariff news. $150 per year. Managing Editor: Wallace I. Longstreth.

Where & When

Sept. 29-Oct. 3—SAE, Aeronautic Meeting & Aircraft Engineering Display, & Aircraft Production, Hotel Statler, Los Angeles.

Sept. 30-Oct. 1—AIEE, Aircraft Electric Equipment Conference, Seattle.

Sept. 30-Oct. 1—Air Traffic Conference, Cargo Advisory Board, San Francisco.

Oct. 1-3—Air Reserve Assn., Annual Meeting. Angebilt Hotel, Orlando, Fla.

Oct. 8-10—National Aeronautic Association, Annual Convention, Portland, Ore.

Oct. 10-17—5th Annual All-Texas Air Tour Information from Texas Aeronautics Commission, Walton Bldg., Austin.

Oct. 13-15—Air Transport Association, Annual Engineering & Maintenance Conf., Saxony Hotel, Miami Beach, Fla.

Oct. 14-15—New York State Dept. of Commerce, Annual Airport Development & Operation Conference, Onondaga Hotel, Syracuse.

Oct. 14-16—AIEE, 6th Annual Special Conf. on Machine Tools, Hotel Cleveland. Cleveland, O.

Oct. 15-16—Aircraft Electrical Society, 10th Annual Display Mtg., Pan-Pacific Auditorium, Los Angeles.

Oct. 18—Los Angeles Air Fair, International Airport.

Oct. 19-22—ATA, Purchasing Committee. Saxony Hotel, Miami Beach, Fla.

Oct. 22-23—Radio Technical Commission for Aeronautics, Fall Assembly, Sheraton Park Hotel, Washington, D C..

Oct. 28-30—Southeastern Airport Managers Association, Annual Convention, Marlin Beach Hotel, Fort Lauderdale, Fla.

Oct. 29-30—National Business Aircraft Assn. (formerly CAOA), 6th Annual Forum & Meeting, Park Plaza Hotel, St. Louis, Mo.

Nov. 3-4—Transport Aircraft Hydraulic Conference, sponsored by Vickers, Inc., Park Shelton Hotel, Detroit, Mich.

Nov. 3-6—National Association of State Aviation Officials, Annual Meeting, Edgewater Gulf Hotel, Edgewater Park, Miss.

Nov. 5-6—SAE, Fuels & Lubricants Meeting, Conrad Hilton Hotel, Chicago.

Nov. 16-17—American Society for Quality Control, Aircraft Quality Control Conf., Biltmore Hotel, Dayton, O.

Nov. 19—National Air Taxi Conference, Annual Meeting, Broadview Hotel, Wichita, Kans.

Nov. 19-21—National Aviation Trades Assn., Annual Convention, Broadview Hotel, Wichita, Kans.

Dec. 3-5—7th annual Arizona Aviation Conference, Yuma, Ariz.

Dec. 17—17th Wright Brothers Lecture (sponsored by IAS), U. S. Chamber of Commerce Auditorium, Washington, D. C.

INTERNATIONAL

Oct. 5-10—IATA Annual Assembly, Montreal, Canada.

Oct. 10—International Air Race, England to Christchurch, N. Z.

Nov. 1-22—IATA, Traffic Conferences, Honolulu.

Nov. 17—ICAO, African-Indian Ocean Regional Air Navigation 2nd Meeting, Santa Cruz, Bombay, India.

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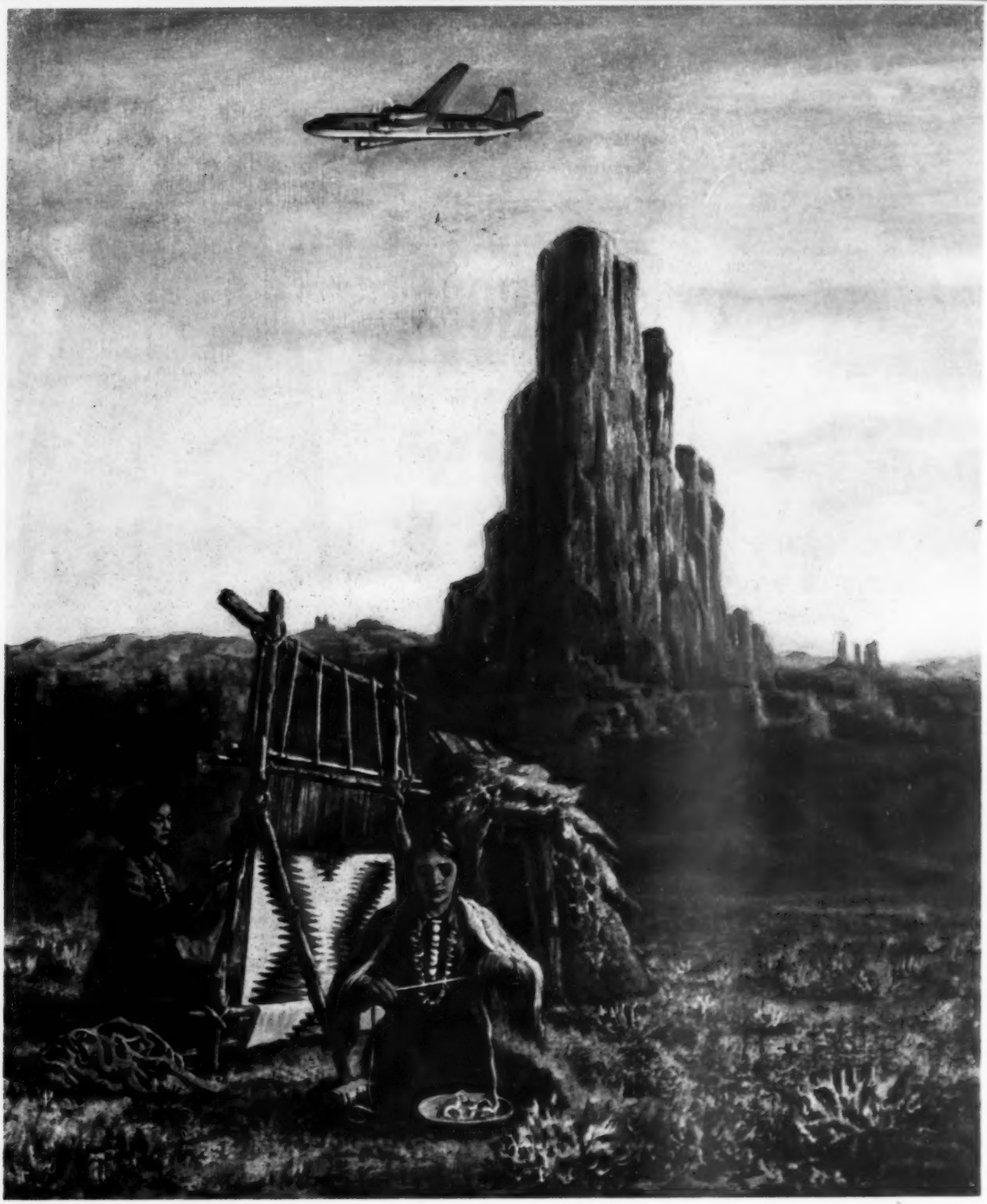

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Cars and Research

BUDGET CUTS, stretch-outs, and other economy moves of the new administration have not bothered the aviation industry half as much as the Pentagon's attitude toward research. As anyone even remotely concerned with the science of aeronautics well knows, research is the very heart, the very crux, of air power and supremacy in air power.

Industry's fear is that the top civilian command headed by Defense Secretary Wilson doesn't really understand air research. What Secretary Wilson means by research and what air power needs in the way of research could well be at opposite poles. So far the issue isn't pinned down; a lot of the so-called research eliminated by the budget cuts can well be dispensed with and doesn't affect the basic work needed to be done by industry.

by W. W. P.

Inevitably it is tempting for aviation people to compare research by the automobile industry with air research for no other reason than the fact that automotive executives are in top spots in the Pentagon. If airplanes were designed and built with the same research care that goes into automobiles we'd be lucky to have a half-dozen airplanes flying today.

The automobile industry can be justly proud of its production miracles, but the record of design and product engineering, especially since the war, is a dismal one. Detroit products today are glamorous and saleable and they hit the mass market. But the engineering that goes into today's American automobile is as sorry as anything ever whipped up in the modern industrial era. That is one reason why aviation is understandably concerned about the Defense Department's attitude toward air research. Does Defense *really* understand what is needed?

Awkward But Inevitable

The United States is about to embark rather awkwardly on the inevitable historic step of carrying some first class mail by air, a step taken full-out before World War II in all of Europe. Within a short time first class mail is to be carried on a space-available basis between New York and Chicago and Washington and Chicago, but the scheme will spread throughout the country in due course.

The European countries have long enjoyed a very simple and efficient postal scheme. All first class mail is dispatched by the fastest means within Europe, and the public pays no additional postage for letters going by air. In fact the sender of a letter never knows how the letter is to travel—he is assured that it will go by fastest means.

It hasn't been as easy as that to institute first class carriage by air in the U. S., hence the transition is likely to be somewhat painful for the time being. As for the initial stage, the natural question arises as to why anyone in New York should put a six cent airmail stamp on a letter bound for Chicago when he can put on a three cent stamp and have reasonable assurance that his letter will also go by air. The Post Office answer is that a six cent stamp guarantees air mail delivery and a three cent stamp doesn't. But such a system can work satisfactorily only for awhile. Inevitably all first class mail must be transported by air when air is faster than surface.

What this will do to Post Office revenues is difficult to estimate. Our guess is that the domestic airmail stamp will have to disappear in time and first class rates will go up. For far too long the Post Office has been making a handsome profit out of airmail stamps, and the public has been denied the benefits of over-all efficient distribution.

As for the carriers, the P.O. suggested payment on a record low level, and the CAB has given its approval. It all adds up to the beginning of faster mail service for the public, new business for the airlines (at much lower rates of pay), and a new era in this country's postal service.

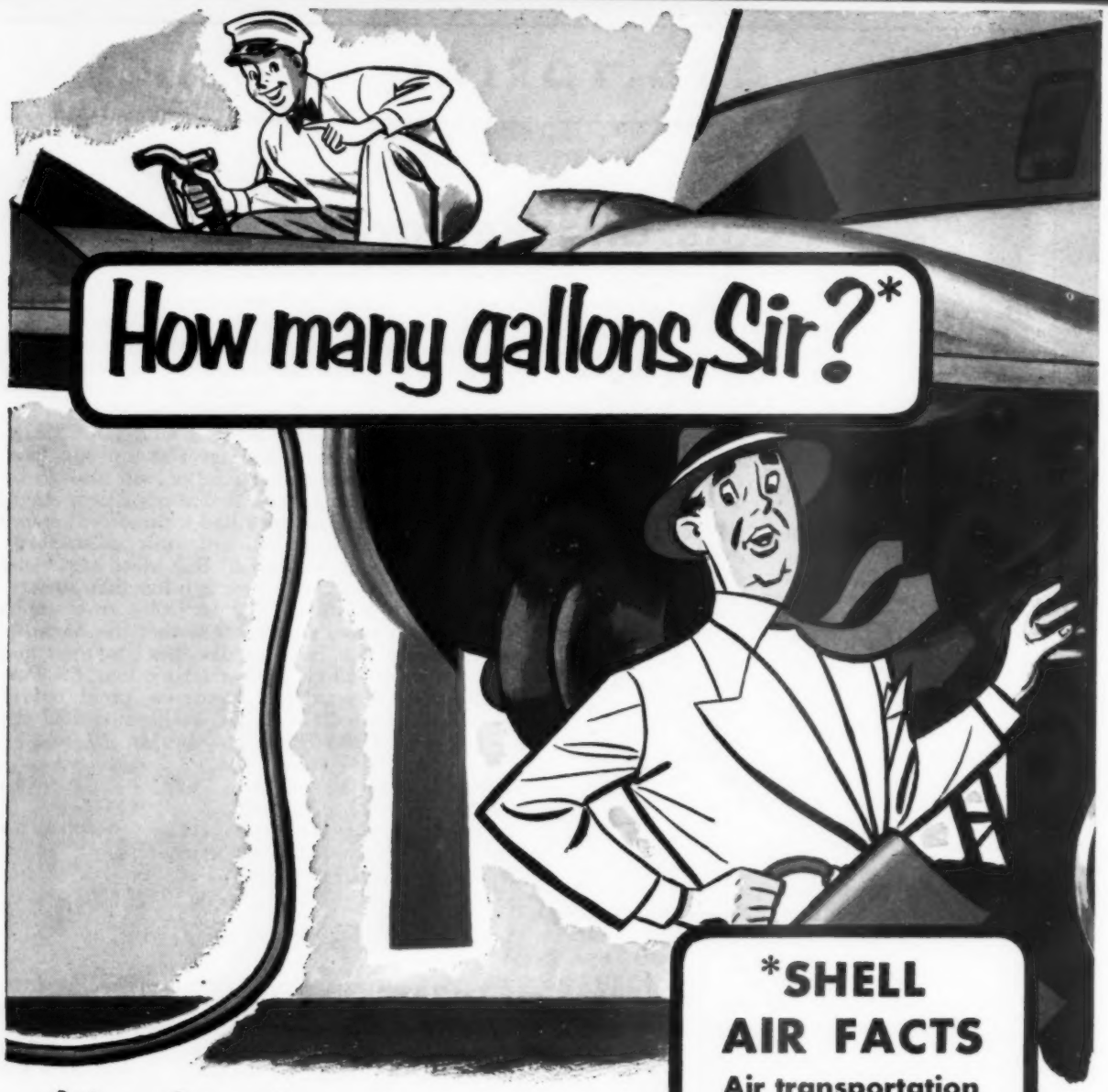
Ike Makes History

No one can say just when it happened, because it has been a gradual process, but the U. S. Government executive department today is being operated on air transport schedules to a degree hardly dreamed of 20 years ago. President Eisenhower has set the pace. First came the unprecedented use of air transport in the 1952 national campaign. Since then, air transport has become standard for White House travel and operations.

Particularly illustrative of historic change was the occasion when the President attended the service for the late Senator Taft at the Capitol at noon one day, flew to the Governor's conference dinner in Seattle on the opposite side of the country in the afternoon, spent the next day with the governors, and was back in his office early the following morning. On his vacation in Colorado, air transport has provided a direct link between the summer White House and Washington.

Business has been carried on "as usual." The airplane has knitted the country together administratively in an impressive way and the President has led the way. Former President Truman was probably the last chief executive to use the railroad to any extent.

. . . WAYNE W. PARRISH.



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Letters

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MORAL RE-ARMAMENT

To the Editor:

For some time I have received copies of AMERICAN AVIATION which I have found useful.

Your article in a recent issue regarding T. E. Braniff was significant in that you highlighted his part in a constructive approach to world affairs that all American businessmen should be taking. As an aerodynamics design specialist at a large west coast aircraft factory I am glad to see that a number of aviation leaders are taking the initiative in the western world's counter ideological thrust.

In a joint statement George T. Baker, president, NAL; W. T. Babbitt, regional vice president, ALPA; J. H. Brock, vice president, Industrial and Personnel Relations, EAL; Edgar H. Chambers, general chairman, IAM (EAL) District 100; Humphrey W. Toomy, manager, Latin American Division, PAA; and Joseph J. Oliver, first vice president, Air Line Stewards and Stewardesses Association, recently said: "The world has become a vast network of swift communications. Our airlines industry makes communities of continents. Space has been tamed. Yet it is not enough for us to connect East and West, North and South across the skies. We must find a way to unite humanity."

The accompanying picture dramatizes the use of an Air India Constellation "Kashmir Princess" in carrying a delegation of Indian and Pakistan leaders to meet 1000 others from 47 nations at the World Assembly for Moral Re-Armament in Caux-sur-Montreux, Switzerland. This part played by aviation in giving the nations of the free world a dynamic understanding of and allegiance to the moral ideology upon which America was founded could well be the keystone to winning the cold war.

HAROLD B. CROCKETT
4732 Indianola Way
La Canada, Calif.

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COLLISIONS

To the Editor:

"It doesn't surprise me!" This is the common phrase used to describe the personal reactions of all the people I've met since American and United have had their mid-air collision.

As a matter of fact, it looks like we are going to have to abandon the idea of contact flight rules and dispatch planes *sensibly* rather than *haphazardly* because, after all, you can't expect pilots to see everything, especially another plane traveling at the same rate of speed!

There used to be a saying "Don't overdrive your headlights," and in an airplane it's twice as easy to overfly your eyesight.

Let's start pushing for more stringent CFR rules before 100 people get killed.

W. W. ANDREWS
11351 Avenue J
Chicago 17, Ill.

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POWER LINES

To the Editor:

Within the past two months there have been several airplane accidents in our vicinity, two of which were occasioned by striking a high tension line and one by striking a guy wire supporting a television transmission tower. The accidents proved fatal to several persons and some of the others sustained extremely severe injuries. The importance of the problem of day marking of overhead transmission lines continues to increase.

Particularly, it is interesting to note that on Friday, August 21, 1953, a two-seater Cessna plane struck a power line which crosses the Juniata River approximately eight miles east of Lewistown. Walter M. Hawkins, one of the occupants of the plane and apparently the pilot, is a Trans World Airlines pilot with a record of 16,000 hours in the air. He probably is a member of Aircraft Owners & Pilots Association. It certainly seems that when a pilot with such experience is forced to descend over a river that a power company is not justified in refusing to adopt some means of marking its lines.

I do not know at this time what caused pilot Hawkins to descend to 40 feet above the Juniata River, but as I read the news releases I expect that he was experiencing flying difficulties.

I am trying to collect instances where means have been adopted to mark power lines to warn pilots of their presence, particularly during the daytime. If you find it proper, I would appreciate your publishing the following in your "Letters to the Editor" section of AMERICAN AVIATION:

> "The undersigned is collecting as many instances as possible where means have been adopted and used to mark high tension electric lines to make their presence known to pilots, particularly for daytime flying. If you know of any such instances will you please inform the undersigned."

Your cooperation will be most sincerely appreciated.

ARTHUR BERMAN
P. O. Box 1177
Harrisburg, Penna.

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REAL TALENT

To The Editor:

Maybe we're prejudiced since Wally Longstreth is a Capital alumnus, but the general consensus in our airline is that the *Extra Section* column in the Aug. 31 issue of AMERICAN AVIATION is one of the most humorous and best written we've seen in a long time.

Naturally, all of us are happy to see one of "our boys" make good but that isn't the reason we'd like to see more of Longstreth on your pages. He's good. Anybody who can translate tariffs into human interest has got to be good.

BOB DOTY
Capital Airlines
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SYMBOL OF WORLD SOLIDARITY is Air-India Connie which carried representatives from India and Pakistan to Moral Re-Armament meeting in Switzerland.

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Industry Spotlight

(Once again Britain's Farnborough Flying Display and Exhibition has caught the attention of the world's aviation leaders. The following notes, taken from extensive details gathered by AMERICAN AVIATION'S *London Technical Editor, James Hay Stevens, focus attention on some of the details largely overlooked in general stories on the show.—Ed.)*

Armstrong Siddeley—An ingenious working diagram showed how new rockets will be throttled—even showing the aft movement of shock waves in the jet as power is increased. The new system, which regulates the fuel supply to the turbine unit, permits a wide range of thrust from about 200 pounds right up to full power. This is obviously the system for the much rumored Screamer.

•

Handley Page Victor—The "Horrible" certainly takes off and lands in a short space. Tall tail shakes violently when taxiing, prompting rumor that the stabilizer will be lowered. Plane is reported to fly itself with hands and feet off controls, reflecting pitch stability of wing sweep, high tail and wing downwash deflection from large slotted extension flaps.

•

Gloster Javelin—Plane flying at Farnborough was the structural test model which was drafted for demonstrations following loss of first two prototypes. This model does not have the new wing but did show two large holes in leading edge of outer wing panels. Openings are about four inches in diameter, suggesting that they were designed for rockets rather than as 30 millimeter gun ports.

•

Bristol Britannia—It seems that the general instability of large airplanes tends to be exaggerated by pure Flettner servo controls. In flight you can see the aircraft hunting in all three axes, requiring almost continuous control movement for correction.

•

Delta Techniques—Flying six deltas in close formation (two Vulcans, two 707A's, one 707B, and one 707C) showed that control characteristics are precise. Take-off was interesting: the two bombers took off successively with different styles. One went immediately into a steep climb, the other was held down to gather speed. In both cases breaking ground was rapid and at very moderate speed—the wing loading is probably around 30 pounds per square foot. Both pilots gave full up elevator until the planes were airborne. Take-off angle of attack looked about 20°-25°.

•

Vulcan—Plane has ordinary power control surfaces, obviously fully power operated since there are no tabs, with each surface split: two elevators, two rudders, so that control is duplicated throughout. Vulcan's trailing edges, reading outboard, carry trim flap, two elevators, and two ailerons. Only difference between first and second airplanes is added radome for blind bombing and Olympus engines.

•

Hawker Siddeley—The Ministry of Supply has been persuaded to install AS Sapphire engines in the first Vulcan to get comparative range data and possible basis of using these engines in production aircraft. Sapphire engines are about 1000 pounds lighter per engine installed, but specific fuel consumption is about 0.1 pounds per pound of thrust higher.

•

Swift and Hunter—Only emphasis on large wing area linked the bulky Swifts and slim Hunters. Swift had two-position afterburners which gave pronounced acceleration and rocket climb to about 15,000 feet. Both the F.3 and F.4 were shown with only two wing fences instead of four.

•

Short S.B.6 Seamew—The Seamew was almost as quick on take-off as the de Havilland Beaver and climbed at a steep angle. Performance confirmed reports of a 50 mile per hour stall speed (light) and about 200 mph maximum speed. Maneuverability was good with rapid roll. Slow flying level was very slow indeed.

1918—Pikes Peak, Colorado, was historic site of first G-E turbosupercharger tests

1920—Dr. Moss of G.E. (left) stands with USAS pilots who flight-tested G-E turbo

1921—Record altitude flight was made in "souped-up" turbo-equipped LePere biplane

1928—Army experimental airplane at Wright Field reached record 37,854 ft. with G-E turbo

1937—Northrop Gamma test plane proved turbos OK for use on commercial airliners

1939—B-17s equipped with G-E turbos flew coast-to-coast in 9 hours, 14 minutes

1944—In Pacific, Boeing B-29s bombed from high altitudes with aid of G-E turbos

1946—twelve G-E turbosuperchargers help increase range and altitude of Convair B-36

1953—Bigger payloads, higher flight is possible today with G-E turbosuperchargers

1918-1953 . . . G-E Turbosuperchargers Help American Aircraft Achieve

Higher, faster, more economical flight

G.E.'s Dr. Sanford Moss (shown at right with Lt. Gen. "Jimmy" Doolittle) fathered the turbosupercharger, which today makes possible higher, faster, more economical flight.

Thirty-five years ago, in the summer of 1918, the first turbosupercharger test began on top of Pikes Peak, Colorado. Engineers who watched Dr. Sanford Moss' experiments were impressed. For at 14,110 feet, G.E.'s new "supercharger" enabled a WW I Liberty engine to produce 356 hp—6 hp more than the engine could produce at sea level.

To commemorate the 35th anniversary of the turbo, a special celebration was recently held at the original Pikes Peak test site. Turbosuperchargers—the "stilts" that permit today's piston-engine planes to fly at higher altitudes with bigger payloads—are, we feel, typical of the contributions made to aviation by General Electric. In years to come, G.E. will continue to develop and produce new equipment for U.S. aircraft. Equipment for higher . . . faster . . . farther flight. 230-20

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Another B. F. Goodrich first in aviation, the new high pressure tubeless tire for combat jets is the latest example of BFG's leadership in rubber research and engineering.

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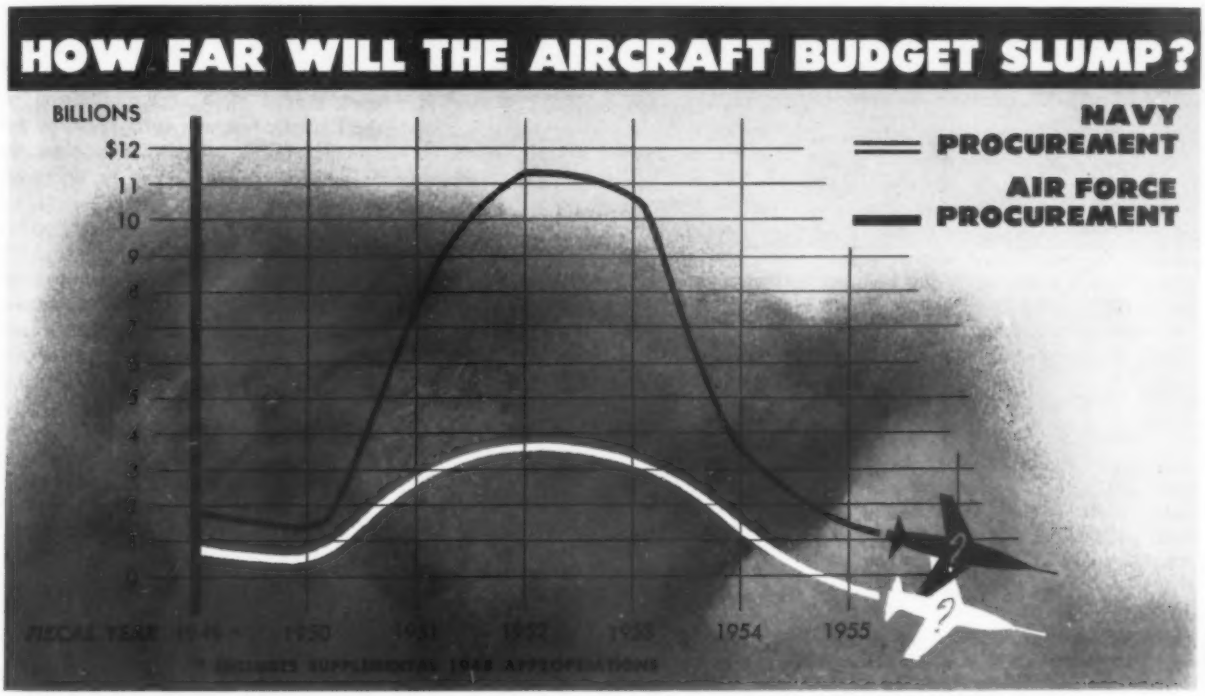


SPENDING on aircraft and related items has fallen sharply from 1952 peaks. Figures from AIA.

Second Source Engine Plants Hit by Cuts

Latest production slashes will save $400 to $500 million, USAF claims; prime producers relatively unhurt.

By Harry S. Baer, Jr.

FOLLOWING careful study of the aircraft engine program, Air Force officials have come forth with a plan to pare thousands of engines off the production program. Although there was no mistake in original orders, they state, the manufacturers have built such superior turbojet engines of late, allowing much greater time between overhauls, that the AF is now in a position to save between $400 and $500 million in powerplants.

Second source engine producers will be hit hardest, according to AF Secretary Harold E. Talbott, who noted recently that "such secondary sources as Packard, Studebaker, Nash, Buick, and Chevrolet, who are licensees and not prime engine manufacturers, may complete production of our engines sooner than originally planned." Packard and Studebaker are producing General Electric J47's, Buick the Wright J65, and Nash and Chevrolet are building R-2800 and R-3350 reciprocating types, respectively.

Talbott said the four mainstays in AF engine production—Pratt & Whitney, Wright, General Electric, and Allison—would not be materially affected, although some cuts in J47's are on the way at G.E.'s Evendale, O., and West Lynn, Mass., plants. The J47—which powers the Boeing B-47 Stratojet, North American F-86 Sabrejet, and the B-36 intercontinental bomber (assisting reciprocating engines)—will suffer the largest slash.

The AF secretary pointed out that the J47, priced between $55,000 and $60,000, has increased its period of time between overhauls from 100 hours up to 1000 in many instances and that, on the average, AF turbojet overhauls have reached the 250-hour mark, a conservative figure. In addition, less than 1½% of some 600 Stratojets have been involved in accidents, he noted, consequently bringing about requirements for fewer J47 engines.

The engine cancellations and reduced monthly production rates are likely to affect almost all jet engines and piston engines now being built for the AF to some extent. One of the original turbojets—the Allison J33, still in production—has probably reached the end of the production line with the current AF reduction. The Wright J65 used in Republic F-84's and Martin B-57's will be immediately stepped up

in production but "reduced in the future somewhat."

Of particular importance is increased emphasis on the P&W J57, which Talbott has termed "the AF's future engine." This powerplant is to be used on the Boeing B-52 bomber and the North American F-100, the McDonnell F-101, and the Convair F-102 fighters. Talbott noted that Ford, second source producer of the R-4360 reciprocating engine, will be given a second source contract for J57 production at Chicago.

"The new 1954 engine program originated in the Air Staff," Talbott said, "and it will not adversely affect the Air Force's capacity to equip 143 wings. The engine reductions have not affected production of one plane, only surplus engines. Prime engine manufacturers will continue at an adequate production rate on existing contracts and on new contracts involving later model jet and turboprop engines."

Oversupply in Europe

Talbott mentioned a great oversupply of engines that are being cut and said he had noted stockpiles of them on his recent trip to Europe. He said the engine program would be studied continually from here on and that the recent slashes would not be fully felt by companies affected until early next year.

He pointed out increased AF emphasis on the development and production of turboprop engines for transports and tankers, but added that "no turboprops are now ready for real production." Allison and P&W are building AF turboprops.

The engine reductions, just following the recent 965-plane elimination in AF procurement planning, have no direct relationship with the aircraft cutbacks. Asked if future aircraft reductions are anticipated, Talbott said, "We don't expect further plane cutbacks."

Meanwhile with considerable aircraft and engine production slashes since the change of Administration, the industry's future has become a big question mark. Procurement planning by the Office of the Secretary of Defense has been difficult for many industry observers to fathom, and coming reductions or expansions have been hard to predict or prepare for.

Some manufacturers have taken a philosophical viewpoint on the cuts. For example, J. E. Schaefer, Boeing Airplane Co. vice president and general manager of the Wichita Division (affected by the cutback of 151 ordered B-47 Stratojets), said they would appear to have a "stabilizing effect" on his plant since schedules would have to be extended "more than a year." But in the same announcement he noted that it would be "immediately necessary to lay off several hundred employes." The B-47 reduction will result in Lockheed's Georgia Division at Marietta laying off some 1500.

Since the general international situation has remained unchanged, a significant development was the Stratojet cut, since these medium jet bombers are combat aircraft. This move tends to contradict earlier statements by Defense Secretary Charles E. Wilson and Deputy Defense Secretary Roger M. Kyes, who have said on numerous occasions that combat aircraft would not be affected by the Administration's economy efforts.

Perhaps in this instance, they have not gone back on their words, since they claim that the B-47 cuts are Air Force-inspired and are not for economy reasons. The money has not been taken out of the AF till. If it were held over for use next year there would be a substantial savings in aircraft procurement, AF officials have said.

Although overall military procurement for aircraft and related equipment has been on the upgrade since 1948 (see graph, page 13), the effect of AF and Navy buying, which is now easing up, will not be felt for a few years. This is due to extensive backlogs in aircraft production, existing contracts which will not be fulfilled for two or three years. If the Defense Department's current economy trend maintains its present pace, however, the procurement figures for future fiscal years will show a marked dip.

Dodge the Roadblock?

Perhaps the biggest roadblock facing a high rate of aircraft production is Budget Director Joseph Dodge, who in a June letter indicated he wanted all government agencies to reduce fiscal 1955 spending by at least as much as fiscal 1954 expenditures are being lowered from the original Truman figures. Whether this "ultimatum" applied directly to Defense Department spending is still in question and depends a great deal on what the Joint Chiefs of Staff request.

A recap of AF aircraft procurement cancellations, amounting to nearly 1000 aircraft since the new Administration took over, shows such major cuts as 420 Beech and Canadair T-36 trainers, 79 Chase C-123B's with the remaining 165 planes of the order still in question, 88 C-119's which were to be produced by Kaiser, eight Boeing KC-97G refueling planes, and the 151 B-47's.

In addition, recent AF elimination of aircraft not contracted for included 18 B-47's, more than 400 Republic F-84's, 175 North American F-86F's, 66 Beech T-34 primary trainers, 141 Lockheed T-33 basic trainers, and 10 Sikorsky H-19 helicopters.

The Navy, too, has been affected by production slashes this year in the form of 100 Grumman F10F's in April, some 100 McDonnell-designed F3H's in June that were to be built by Temco Aircraft Corp. as a second source producer, and this month's announced stretchout of McDonnell production of the F3H Demon and curtailment of the Douglas A2D under which plan 91 fewer of these planes will be delivered to the Navy this fiscal year.

Technical Problems

These cuts, however, appear to be more a result of technical problems than of plain economy. In the case of the F3H's, the Navy noted that these aircraft would be produced later when improved engines are obtained. The Demon originally was to be powered by the Westinghouse J40 turbojet. Curtailment of the A2D attack plane was due to "unfavorable developments" in tests of the plane's turboprop engine —the Allison T40.

AF officials have continually maintained, even in the face of the B-47 cuts, that the planned AF building is not being harmed by the reductions, nor is the national security. A 143-wing Air Force is still feasible under present programming procedures, if the Joint Chiefs of Staff push for this large an air arm, they say.

AF philosophy on the matter is well expressed by AF Assistant Secretary Roger Lewis, who said, "There's nothing insidious about what we're doing. It's just a matter of making the proper adjustments." • • •

Boeing May Build Turbo-Prop Version of 707

The Boeing Airplane Co., which expects to have its 707 jet transport-tanker prototype flying next August, reportedly is seriously considering a turboprop version of the same airplane. The turboprop model, it is understood, would have at least six engines and possibly eight.

Sources close to the situation report that the engines being considered for the swept-wing aircraft are neither Allison T56's (3750 hp) nor Pratt & Whitney T34's (5700 hp). The propjets will presumably be either Curtiss-Wright T47's or P&W T52's.

Outcome on C-123B Bids Awaited

Five aircraft manufacturers are awaiting the outcome of bids they submitted to build the Chase-designed C-123B assault transport if the Air Force decides to go ahead with production of some 165 of the planes. Firms involved are Consolidated Vultee Aircraft Corp., Lockheed Aircraft Corp., North American Aviation, Inc., The Glenn L. Martin Co., and Fairchild Engine & Airplane Co., a last-day entry in the bidding which closed on September 10 at Air Materiel Command headquarters.

All of the companies except Fairchild received special AF invitations to enter the competition. The Hagerstown, Md., firm asked for and received permission to submit a bid from AF Assistant Secretary Roger Lewis. Richard S. Boutelle, Fairchild president, said, "It's our kind of business and you don't get it without trying." Fairchild produces the C-119 cargo and troop carrier.

Immediate Order Near For Additional F-100's

Although the Air Force has not revealed how many more North American F-100 supersonic fighters will be placed on immediate order, Pentagon sources have indicated the figure is "just under 100." This information follows AF Under Secretary James H. Douglas' recent statement that the AF has "put on order an additional number of the most advanced day fighter that is ready for production—the F-100." The plane is powered by the Pratt & Whitney J57 turbojet.

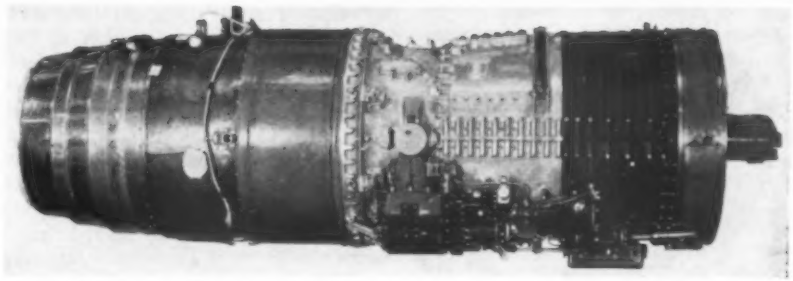
USAF Won't Recall Leased C-54's

In a complete reversal of earlier Air Force planning, the 37 USAF-owned Douglas C-54 transports now leased by commercial operators and slated for early return to the military will not be recalled. Instead, the present leases will be renewed and rental rates increased, AF officials have announced.

New lease rates will be determined by negotiation with the 11 operators now using the aircraft, and terms will include a provision to insure a continued high grade of maintenance. The Air Force also plans to set up a reserve fund for overhaul and periodic reconditioning, and these funds will be used by operators for maintenance of the aircraft while in their possession.

Earlier this year the Air Force had advised all lessees that present contracts which expire on December 31, 1954, were to be terminated, but the halt in the Korean war and a reduction in Pacific airlift requirements has resulted in the new decision to extend the leases.

Operators now using the AF transports are Pan American, 16; Trans World, 2; Northwest, 5; Great Lakes, 1; Viking, 1; Transocean, 1; Seaboard & Western, 1; Flying Tigers, 2; George Enloe, 2; Francis Christmas, 2; and Overseas National, 4.



Unveiled at Farnborough for the first time was the Saunders-Roe 45-pound-thrust pulsejet designed principally for helicopter rotor tip propulsion (top). Saro is also developing a new pulsejet with twice as much power. The Rolls-Royce Avon RA. 14, latest military version of the power plant which went into production in 1948, has reached a thrust of 9500 pounds without afterburning. A civil version of the RA. 14, the RA. 16, will power the Comet 3.

CAB Investigates Crash

A top Civil Aeronautics Board staff of accident investigation officials, headed by Chairman Oswald Ryan, formed the inquiry panel at a public hearing last week to determine the cause of a mid-air collision between an American Airlines Convair 240 and United Air Lines' Convair 340 over Michigan City, Ind., on August 27.

The Board said that it considered a public hearing in this instance to involve far more than the usual number of air safety and major policy problems. Among such problems believed to be under consideration by CAB are those of air traffic control and aircraft cockpit visibility, as both aircraft at the time of the incident were said to be operating under VFR flight rules, in daylight, at 11,000 foot altitude.

Admiral Says Missile Reliability Doubles

The reliability of some missiles now under development has been doubled during the past year, Rear Adm. John H. Sides, a member of the Defense Department's special missile team and director of guided missiles for the Navy, told an Aircraft Club luncheon group in Washington recently.

Admiral Sides and eight other leaders in the missile field are nearing completion of an evaluation of missile programs of the three services in an attempt to eliminate duplication of efforts. Trevor Gardner, special assistant on research and development matters to AF Secretary Harold E. Talbott, heads the committee.

News Briefs

A new world speed record of 727.26 average miles per hour has been set by Neville Duke of Great Britain, flying a Hawker Hunter powered by an Avon engine equipped with afterburner. Still to be confirmed, the new record betters the previous mark of 698 mph set by an F-86.

•

First use of the Westinghouse J46 jet will be in the Navy's tailless Chance Vought F7U-3 Cutlass. The lightweight (2000 pounds) engine will replace the J34, used on earlier models. The J46 has completed the Defense Department's 150-hour test.

•

The first F-86H has come off the production line at North American with the added thrust of General Electric's J73 engine, heavier landing gear, and improved suspension and release mechanisms for droppable wing tanks.

•

An incorrect impression was conveyed by an item in the issue of August 31, which stated that Northwest Airlines had netted $34,253 in the first six months of 1953, as compared with $545,761 during the comparable period in 1952. The 1952 figure should have been identified as a loss, not a profit.

•

Hughes Aircraft Co. owes $191,056 in back taxes to Pima County, Ariz., on a plant that it sold to the Air Force in 1951, according to Attorney General Ross F. Jones of Arizona. The deed involved in the sale of the missile was never recorded, leaving Hughes technically the owner and taxpayer.

•

Adjustments in future subcontracts for B-47 engine nacelles have been forecast by the AF, and as a result Bell Aircraft Corp. will lay off between 200 and 300 workers at its Niagara Falls plant. The B-47 was hardest hit in recent AF cutbacks.

•

Col. Francis Gabreski wouldn't trade an F-86 for any version of the MiG-15, late or early, according to North American Aviation. The assertion was made in answer to an article by Lt. Frank Jarecki, escaped Polish pilot, who recently claimed that Col. Gabreski agreed with him that the U.S. should build super MiG's instead of super Sabres.

•

The second session of CAB's annual review of airworthiness regulations, originally scheduled to begin October 5, has been postponed until December 7 in order to allow time for preparation of trial flight manuals in connection with the new transport category performance requirements. First session will begin on schedule.

•

Negotiations over a new flight test base for Douglas are being conducted. New site would be at Minter Field, 15 miles from Bakersfield, Calif. Plans call for extension of present 4500 foot runway to 10,000 feet.

•

Only major change in recent USAF revision of regulations covering use of its bases by civilian planes is a reduction in the amount of bodily injury insurance required. Coverage of $50,000 per aircraft seat was formerly specified; amount has now been cut to 75% of this.

•

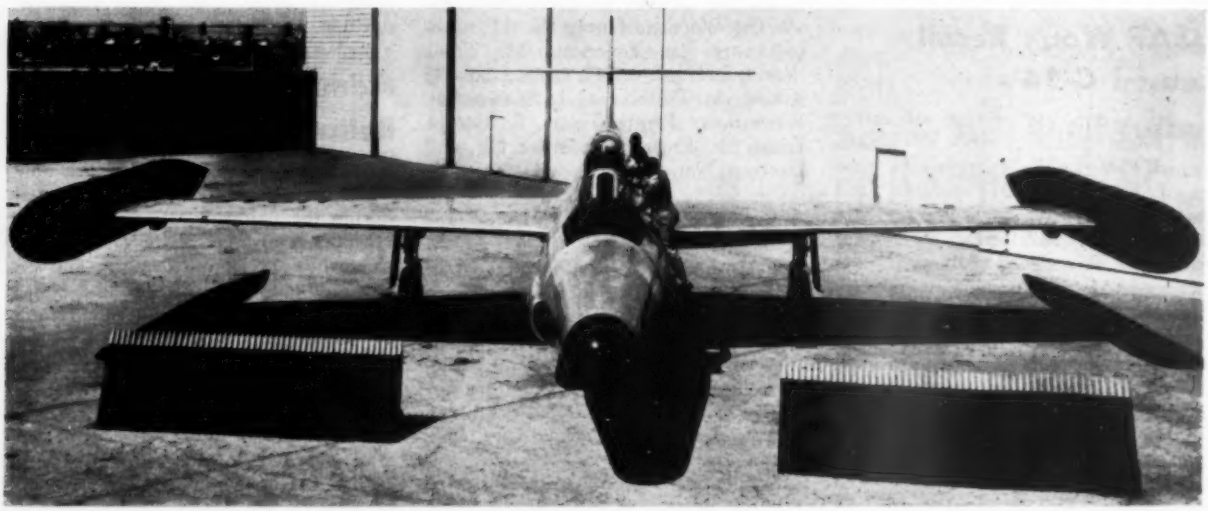
Work on atomic propulsion for aircraft at General Electric has been elevated to the status of a department, with headquarters in Cincinnati, where jet engine work is centered. The new department will form part of G.E.'s Atomic Products Division.

•

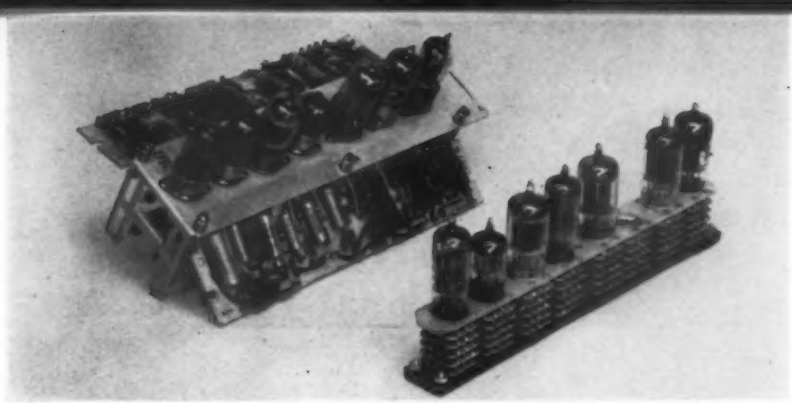
Replacement of Douglas C-124A's with C-124C's has begun in MATS with deliveries to the 1703d Air Transport Group at Brookley AFB, Ala. Change gives the aircraft 300 more hp per engine, center point refueling, and APS-42 search radar antennae.

•

Only two states—Pennsylvania and Vermont—are now left with a full tax on avgas, following Alabama state legislature action providing for refund of five cents per gallon from the present six-cent gas tax for "general" aviation.



One hundred four rockets are carried in the permanently attached pods on the wing tips of the Northrop F-89D Scorpion. The array of missiles is represented by dummies in the picture above.



CONVENTIONAL RADIO ALTIMETER is shown in background, above. Corresponding Project Tinkertoy unit, made up of modules, is in foreground.

Modules May Revolutionize Electronics

In new production technique machines assemble wafer-like circuit components; great savings expected.

By Joseph S. Murphy

THE ELECTRONICS manufacturing industry, with its energies already taxed to the hilt to keep pace with such technological advances as the development of the transistor, has now been presented with a new and even greater challenge—one that promises to revolutionize the industry's production facilities with an entirely new concept of electronic equipment design.

The challenge came earlier this month in the form of a joint announcement by the Navy Bureau of Aeronautics and the National Bureau of Standards that the top secret security classification was being removed from "Project Tinkertoy," a production research program which has successfully developed a method of producing electronic components by almost entirely mechanized means.

The joint Navy-NBS project began in 1950 with a $5 million funding to find a way of breaking the electronics production bottleneck which had proven a serious problem both during World War II and again at the outset of Korean hostilities. The method developed by NBS and now patented in the name of its inventor, Robert L. Henry of the Bureau of Standards staff, is called the MDE, or modular design for electronics and the manufacturing process, MPE, or mechanized production for electronics.

This MDE system is built around the use of a ceramic wafer measuring ⅞" square by 1/16" thick, ceramic capacitors, and adhesive tape resistors. Using these three basic components and employing conducting paints in place of wiring, along with automatic dip soldering techniques, a "module" consisting of four to six wafers bearing the various circuits associated with a particular electronic stage is mechanically produced.

This method completely supplants the conventional manual assembly of resistors, capacitors and wiring into a similar electronic stage, and offers a virtually unlimited potential in reducing production costs and accelerating output. With even greater advances expected with industry adoption of the new "building block" approach to electronics production, it is anticipated that an electronic stage now costing an average of $100 to manufacture may be produced under the modular method for as little as 50 cents.

In removing the secrecy wraps from "Project Tinkertoy," Navy officials said that the program is now being turned over to industry to carry the ball. A Navy spokesman also added that BuAer is not contemplating the establishment of a facilities project within the Navy for large scale production of MDE designed equipment, nor is the Department of Defense considering a parallel to the "heavy press program" to underwrite the conversion of present electronics facilities to the new concept.

MODULE takes place of individual capacitors, resistors, etc., in circuit.

After the basic idea was conceived and developed by the Bureau of Standards in 1950 (including the design of a pilot plant), the detailed design and manufacture of production equipment was handled under contract by the Kaiser Electronics Division of Willys Motors, Inc. Some specially designed production test units, which provide 100% automatic product inspection throughout the mechanized assembly line, were developed by Communication Measurements Laboratory, Plainfield, N. J.

Proof of the success of the new system of manufacture obviously rested in its application to present electronic equipment. The job of engineering the concept into a current model radio altimeter, a submarine detection device, and a radio control receiver went to Sanders Associates, Inc., of Nashua, N. H. According to the Navy, the performance of these MDE-designed units appears generally equivalent to that obtained from conventional assemblies. Those produced on an experimental basis have met military environmental requirements, passing shock, vibration, temperature, and humidity tests called for in military specifications.

Big advantage cited for the new equipment by the Navy is the standardization and uniformity of quality guaranteed for the end product, which is 100% tested during manufacture.

Although the NBS concept of production was developed as far back as 1950, the 21 machines built for the mechanized assembly line were not set up until September of 1952. At that time Kaiser Electronics transferred its activity to a special Bureau of Standards facility at Arlington, Va., thus beginning a try-out program.

With the completion of this program in May, 1953, Kaiser received a BuAer pilot production contract to manufacture a Sonabuoy submarine detection device using the machines and techniques developed. Today this pilot production is matching the combined output of six other suppliers of the detection device, a Navy spokesman said.

In the hands of industry the MDE techniques are viewed as the source of other major savings, particularly those of space and weight. In the instance of the Sonabuoy, where the conventional model weighed three pounds and occupied a 200 cubic inches, the experimental MDE version weighed 3.5 pounds using the same space, and a pre-production model has already cut the weight to 3.1 pounds. • • •

Leatherneck Fury. The North American FJ-2 is earmarked for the Marines, with speed and other performance characteristics putting it on a par with the USAF's F-86.

The Military Scene

Fairey Delta Number One

(F.D.1), the smallest piloted British delta, is powered by a Rolls-Royce Derwent. An experimental research model, the F.D.1 has a span of only 19 feet, 6½ inches.

New sting in the tail of Lockheed's Neptune consists of the latest in submarine-hunting electronic gear. All details of the new installation are classified.

Murray Calls for Sweeping Policy Changes

Favors withdrawing all Federal aid from trunk carriers; Commerce has "intensive studies" under way.

By Eric Bramley

INTENTION of the Commerce Department to play a dominant role in the air transport picture was revealed this month by Robert B. Murray, Jr., Under Secretary of Commerce for Transportation. The Commerce activities will extend into areas covered by the Civil Aeronautics Board.

In a major policy speech that left the industry surprised and puzzled, Murray told the Wings Club in New York on September 16 that his office already has "intensive studies" under way into aviation problems, and that he favors:

- **"Orderly" withdrawal** of Federal aid of all types from domestic trunk airlines.
- **"Critical reappraisal"** of the "mounting federal subsidy cost associated with the feeder line experiment and the international airlines."

Studies under way, he said, seek solutions to such problems as:

- **General question of route certification,** both domestic and international.
- **User charges for airways.**
- **Federal role in airport development.**
- **The emerging competition** between the scheduled and non-scheduled carriers.

Certain to raise questions is how the projected Commerce activities will fit in with those of CAB, which is a quasi-judicial body reporting to Congress. CAB is included within the Commerce Department for "housekeeping" only.

Murray said that "under the terms of Reorganization Plan 21 and other basic statutes, we are charged not only with specific duties in the promotion of aviation but with an overall responsibility for developing a sound and coordinated national transportation policy. It is not possible to develop such a policy without being concerned with broad fundamental issues having to do with each individual form of transportation.

"We must determine the federal government's role and relative interest in and responsibility for each transportation activity, have some idea of the cost involved, and strive for a proper division of the expense. Moreover, we are obligated in line with general administration policy to seek out every possible budgetary economy in the government's performance of its transportation activities."

Robert B. Murray, Jr.

Reorganization Plan 21, which in 1950 established the office of Under Secretary of Commerce for Transportation, stated that this official shall "serve as the principal adviser to the Secretary on all policy matters concerning transportation within the Department and on all matters concerning the transportation policies of the government."

Although the plan gave the Under Secretary no control over CAB, it said that he shall "initiate action before the transportation regulatory agencies when such action appears to be appropriate in order to effectuate over-all transportation policies of the executive branch, and appear before regulatory boards or commissions at his discretion to present his views when matters affecting over-all transportation policies or programs of the executive branch are under consideration, in collaboration with the General Counsel as to the legal aspects."

Murray said it appears that "most of the domestic trunk lines are now eligible for membership in the fraternity of self-supporting transportation agencies. Consequently, the federal aids which speeded their growth from infancy to maturity should be withdrawn in an orderly manner and in accordance with a prearranged schedule."

Air mail subsidies are only part of overall federal assistance, which has also included grants-in-aid for airport construction as well as construction, maintenance, and operation of federal airways, he said, adding that "various elements of federal assistance are interrelated, since, for example, certification of additional routes would augment total requirements for air terminals and air navigation and traffic control facilities, as well as the possible increase of air mail subsidy payments."

In urging reappraisal of local service and international subsidies, he noted that "these payments have been mounting steadily in recent years with every indication that under present policies the outlays will continue to rise."

In citing the domestic trunks' growth since 1938, he said their profit in 1952 was $53 million, that they paid over $17 million in dividends, that they have been able to obtain needed loan capital, and that a "trend of profits has developed in line with the profits in other industries throughout the economy." He added that "of course it is generally known that all domestic trunk airlines are not in as favorable an individual position as indicated by the average figures."

Domestic trunks' subsidy, amounting to $18.9 million in fiscal 1951, will drop to only $3.6 million in 1955, he pointed out.

"However, making all domestic aviation self-sufficient has been complicated by the development of an unbalanced route structure. Such was not the intention of the framers of the Civil Aeronautics Act, whose expressed objective was to avoid the defects experienced in the growth of earlier forms of transportation.

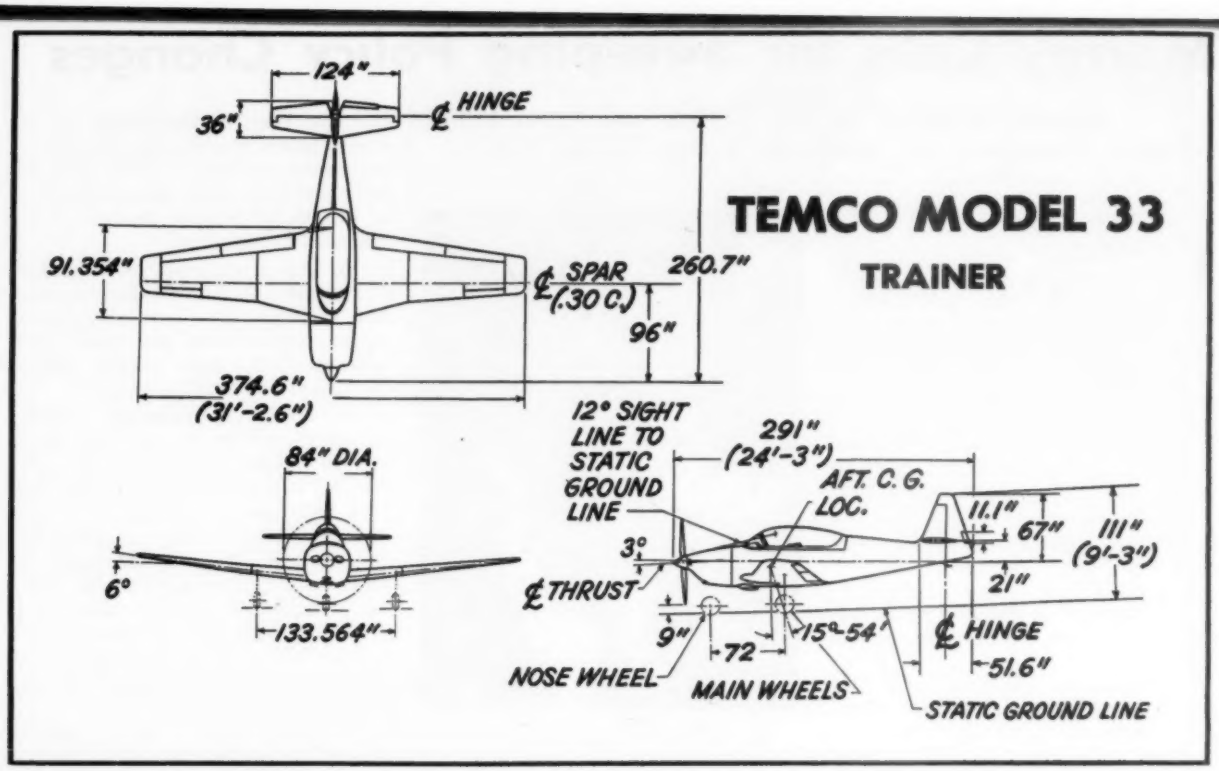
"The presence of weak and strong air carriers 15 years after the passage of the Act is a matter of considerable concern to all those interested in the future of aviation. The CAB has attempted to follow its mandates regarding administration of mail payments, as laid down in the Act. However, this task has been made more difficult by the inheritance of an initial imbalance at the time of the passage of the Act."

The "feeder experiment" is in "sharp contrast" to the trunklines, he said, adding that the feeders' subsidies rose from $19 million in 1952 to $22 million in 1953 and will go to an estimated $24 million in 1954-55. CAB estimates subsidy for three helicopter lines at $2.6 million in fiscal 1954 and $2.9 million in 1955, he said.

"The problem of government support is somewhat different in the international field. In this area, government aid must take account of growing foreign competition and the need for developing an international route position consistent with the requirements of national interest and security."

• • •

Temco built its own landing gear,



75-Day Wonder: The Temco Plebe Trainer

Whipped up on short notice for an off-the-shelf competition, Model 33 is designed around Navy specs.

By William D. Perreault

EARLIER THIS MONTH a completely new aircraft, the Temco Model 33 trainer, rolled from the Dallas, Texas, workshops of Temco Aircraft Corp. onto the flight test line.

The new model had been designed, built and flown from scratch in 75 days.

The Model 33 represents the completed hardware of a promise made to stockholders by Temco president Robert McCulloch less than 120 days before. Temco had just lost its second source production contract for the Navy's McDonnell F3H, a victim of Defense Secretary Wilson's contraction of the aircraft production base. McCulloch told his stockholders Temco would use its own funds to build one or more prototypes and deliver them to the military services for service test and evaluation.

Almost immediately Temco had a chance to prove its new policy. The Navy announced its intention to service test a group of "off-the-shelf" single-engine trainers, in search of a small size replacement for the standard North American SNJ trainers. The specifications called for several characteristics not existing in the Temco Buckaroo, e.g., a tricycle landing gear. A decision to revamp the Buckeroo led to so many compromises that it was abandoned.

With only 90 days left in which to have an "off-the-shelf" airplane ready for the Navy competition, McCulloch's design team, lead by chief engineer H. G. ("Gus") Erickson and his assistant Bill Hurtt, started with a clean sheet of paper. Since then this has been parlayed into the entirely new Model 33 trainer.

The Temco Model 33 is a two-place, low-wing, tricycle-landing-gear trainer. Grossing 2500 pounds, it is about 20% bigger than the earlier Buckeroo. The 225-horsepower Continental engine will provide a cruising speed of 147 knots (171 mph) at 75% power and 8000 foot altitude. Maximum speed at sea level is 160 knots (185 mph). At full gross weight the Model 33 has a rate of climb of 1350 feet per minute. Empty weight is 1800 pounds, providing 700 pounds useful load.

Take-off run of the Temco trainer, over a 50-foot obstacle at full gross weight, is 1142 feet, and landing run (at 2200 pounds) is 1035 feet. Cruising ceiling at full gross is 17,400 feet. Maximum range, based on 500 foot altitude, is 523 nautical miles (600 statute miles) Stall speed is 57 knots.

Since the Model 33 was specifically designed and built to meet the new Navy requirement, it should prove a hard plane to beat. Nonetheless, competition will be tough. Some of the other planes entered in the program reportedly include the Beech Mentor, Ryan Navion, Fairchild SNQ, Fletcher FD-25, and others.

The Bureau of Aeronautics will select two or three of these planes for comparative training tests at Pensacola starting within the next few weeks. These tests will last about two months, with a final decision on a production plane not due until early spring. There

American Aviation Exclusive

VISIBILITY available through cockpit canopy is apparent.

are unofficial reports that these tests will include evaluation of the long-standing controversy of tandem versus side-by-side cockpit arrangements.

Some of the interesting features of the Temco Model 33:

• **The Continental 0-470-13 engine,** rated at 225 horsepower, drives a new constant-speed McCauley prop using hydraulic operating principles. Temco is high in its praise of this new prop.

• **The 50-gallon fuel supply** is carried in Goodyear bag-type cells and fed to the engines from a single sump which houses a submerged boost pump. This eliminates the fuel management problem. Single point fueling is provided and the engine pump is of the vane type.

• **Hydraulic system,** used to operate the landing gear, flaps, and brakes, is of the 1500 pounds psi pressure type and is automatically depressurized when not in operation.

• **Electrical system** features an Eclipse-Pioneer 24-volt, 50-ampere-hour generator, with carbon pile regulator control and a Hartman reverse current relay. Principal innovation is use of a Yardney Battery Company silver-zinc battery of 150-ampere-hour capacity.

This battery weighs about one quarter as much as comparable batteries, contains no fluids, and provides a better load curve which should overcome some of the difficulties experienced with starting trainer aircraft. Although these batteries are used in missiles and rockets, this is the first installation in a conventional aircraft.

Other electrically operated units include the canopy (the motor of which contains a brake and clutch), radio, fuel gage, lights, and starter. Everything but the external power connector and voltage regulator in this system is forward of the engine firewall. No alternating power is required.

Temco's Model 33 Trainer

Engine	Continental 0-470-13
Gross weight	2500 lbs.
Useful load	700 lbs.
Empty weight	1800 lbs.
CG-gross wt., gear up	26.50% MAC
CG-gross wt., gear down	25.80 % MAC
CG-max. aft.	27.90% MAC
CG-max. fwd.	19.95% MAC
Root airfoil	NACA 23015.4 Mod.
Tip airfoil	NACA 23009
Root incidence	3°
Incidence @ Sta. 73.25	2°
Tip incidence	—1°
Dihedral Angle	6°
Stabilizer incidence	—1°
Wing area (total)	146.5 sq. ft.
Aileron area (total)	9.6 sq. ft.
Horizontal tail area (total)	29.9 sq. ft.
Horizontal stabilizer area	17.15 sq. ft.
Elevator area (total)	11.87 sq. ft.
Elevator tab area	1.18 sq. ft.
Vertical tail area	15.3 sq. ft.
Fin area	6.2 sq. ft.
Rudder area (with tab)	9.10 sq. ft.
Rudder tab area	.38 sq. ft.
Flap area (total)	15.52 sq. ft.
Flap travel	30° down
Aileron travel	19.5° up & 16° down
Elevator travel	25° up & 17.5° down
Rudder travel	25° left & right
Rudder tab travel	10° right & 20° left
Elevator tab travel	10° up & 30° down

Temco built its own landing gear, which incorporates up-and-down latches in the overtravel portion of the struts. The nose gear retracts rearward. Wheel brakes are of the Goodrich expander type. Standard C-1 gear signal system is used.

Communications equipment includes Aircraft Radio Corp. VHF radio, T-11B and T-13A transmitters, R-19 receiver, and a whip type of antenna.

Two 250-watt landing lights are arranged so that one can be turned off during taxiing. The navigation light flasher is made by Seaboard Electric.

• • •

Korean Airlift Due for Reduction on October 1

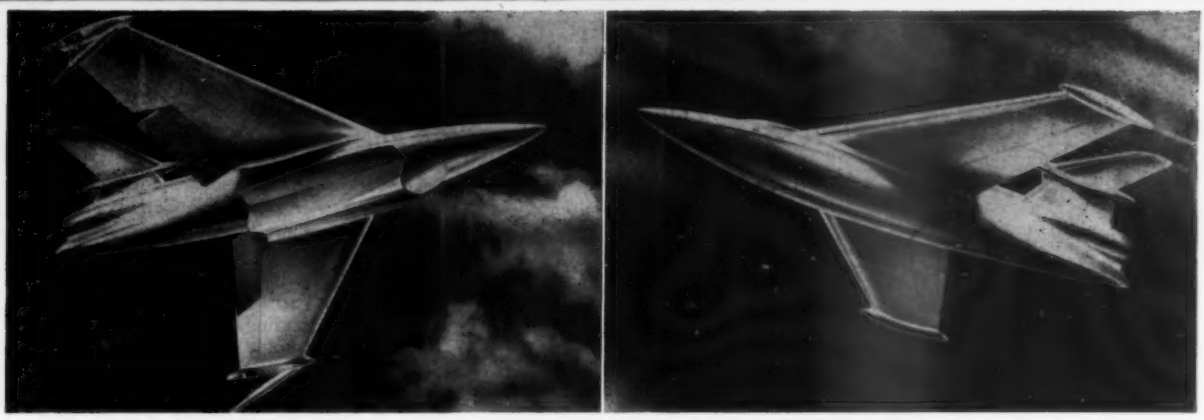
Participation of scheduled and non-scheduled carriers in the Korean airlift is slated to be reduced from 52 to 34 planes on October 1 by the Air Force. With 22 scheduled and 30 non-scheduled aircraft now in use, the new line-up would be 14 and 20, respectively. Scheduled lines' operations would be 13 under Pan American World Airways' prime contract (six PAA, six American, and one Capital) and one by Northwest Airlines. Four planes each would be operated by Seaboard & Western, Transocean, Flying Tigers, Overseas National, and California Eastern.

Sperry Announces Radio Beam Coupler

A simplified commercial version of the U. S. Air Force beam guidance control autopilot, to be called the radio beam coupler, is slated for production as soon as military priority demands are met, the Sperry Gyroscope Co. has announced. The new device, according to Sperry, introduces more effective use of new VOR omnirange beacons and other radio navigational beams.

The radio beam coupler now becomes part of the Sperry automatic pilot system for automatic navigation en route. When approaching an airport on the localizer beam under instrument weather conditions, it detects the intersection of the glide path beams, automatically shuts off the autopilot altitude control, and transfers itself to the glide slope control.

New signal combinations in the Sperry coupler are designed to hold the aircraft at the proper glide angle despite changes in airspeed or such other conditions as turbulent air or the effects of flap and landing gear extension. A safety interlock in the device either prevents engagement or automatically disengages certain of the system functions in event of radio signal failure from ground transmitters.



SAUNDERS-ROE DESIGN for a new water-based fighter may change all previous concepts. The Saro model features a planning bottom which retracts into the body of the aircraft after take-off. Note the modified hydroskis used as the craft comes in for a landing.

Design Projects Unveiled at Farnborough

Britain looks confidently toward future as recent aircraft move from prototype to production stage.

By Robert M. Loebelson

WANTED—Customers for latest in jet and turboprop transport aircraft. Buyers with dollars preferred. Inspection of models at Farnborough, England, September 7-13. For further information, contact Society of British Aircraft Constructors.

Had a classified advertisement similar to the one above appeared in trade and general newspapers and magazines last month, few airline executives anywhere in the world would have been surprised. For this year's Farnborough show, while proudly displaying Britain's latest military aircraft—almost all of which had been shown at the 1952 exhibit—had an undercurrent of commercialism which was obvious to all in attendance. This year's exhibit, for example, featured a commercial day in which military fighters and bombers were ignored and emphasis was placed on the de Havilland jet Comet, the Vickers Viscount and Bristol Britannia turboprops, and several executive planes and helicopters.

No responsible SBAC or British aircraft company official would make any comment on the competition between the U.S. and Britain for jet and turboprop transport leadership for direct quotation, but many were quite willing to talk on the subject provided their names were not used. In essence they said:

"At the moment, the British aircraft industry has firm orders for about 140 Comets, Britannias, and Viscounts, and 30 similar aircraft have already been delivered for airline use. The U.S., on the other hand, is still without a jet or turboprop airliner prototype and the west coast aircraft industry is still without its first order. Britain hasn't necessarily won the commercial gas turbine competition but as more British planes go into service, competing airlines will find themselves forced to purchase similar types. And the only place they can place the orders is Great Britain."

The unnamed British spokesmen conceded that thus far they had been unable to crack what they termed the "gentlemen's agreement" among domestic airlines in the U.S. not to buy British transports. But they hinted that interest in the four-engine turboprop Viscount by U.S. carriers was especially strong.

There were two tangible indications of the progress Britain is making in selling her gas turbine aircraft at the Farnborough show:

• **Vickers did not have a Viscount** of its own available for display and was forced to rent one from Air France.

• **De Havilland,** not wanting to delay the Comet 2 flight test program, exhibited a Comet 1A equipped with Avon engines instead.

On the military side, the world's aviation leaders who make the annual September pilgrimmage to Farnborough to discover what new prototypes SBAC will be showing, were disappointed because the so-called "new" aircraft on display this year were generally previously displayed planes fitted with new engines or were merely later models. Examples:

• **Hawker's Mark 2 Hunter** equipped with an Armstrong-Siddeley Sapphire engine instead of the Rolls-Royce Avon.

• **English Electric's Canberra** fitted with two Bristol Olympus jets instead of Avons.

• **Avro's Vulcan four-engine delta-wing** bombers using both Sapphires and Olympus turbojets.

Britain's aircraft officials concede that there was not much really new on display this year, but reply that this was merely an indication that Britain had started producing on a much larger scale and is no longer merely building prototypes.

Their point is well taken, for all indications are that while British plane builders are not delivering military aircraft in anywhere near the quantities of their U.S. counterparts, they are building such models as the de Havilland Venom and Sea Venom, the Hawker-Armstrong Whitworth Sea Hawk, and English Electric Canberra in respectable numbers at present and will be starting quantity deliveries of such "super-priority" aircraft as the Hawker Hunter, Gloster Javelin, Fairey Gannet, Vickers-Supermarine Swift Mark 4, and the V-class four jet bombers, the Vickers Valiant, Avro Vulcan, and Handley-Page Victor before too many months have past.

But while the aircraft parked and flying at Farnborough were generally well known, the static displays in the nearby tents showed that Britain's designers were still active. This was especially true of Saunders-Roe, Ltd., and Percival Aircraft, Ltd. Saro's stand

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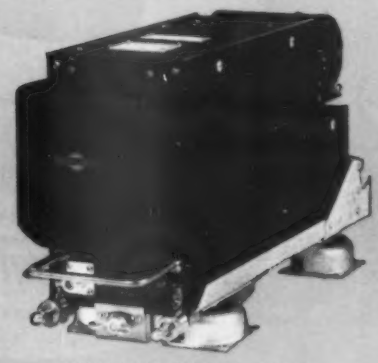
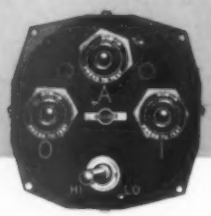


51V-2 Glide Slope Receiver



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featured a model of a jet-powered successor to the Princess flying boat, the Duchess; a model of a transonic hydro-ski-equipped fighter with its jet engine mounted above the fuselage, the P.121; and a design for a helicopter accommodating 50 or more passengers over ranges greater than 100 miles. Saro envisions the twin-engine rotary-wing craft as a replacement for the Douglas DC-3.

One of the Percival projects displayed in model form was another DC-3 replacement, the P.87, which is a twin-engine pusher type (Napier turboprop engines) capable of carrying 36 passengers. The P.87, with a gross weight of 26,000 pounds and a disposable load of 10,500 pounds, is said to be capable of operating from small grass airfields.

The other unique Percival design was a turbo-rotor helicopter now under construction for Britain's Ministry of Supply. With a gross weight of 8200 pounds (disposable load 3330 pounds) and a capacity of eight passengers, the P.74 uses a Napier "high efficiency, low-pressure gas propulsion system" which, Napier says, avoids all mechanical couplings between the source of power and the rotor.

With most of the interest focused on the Comet, Britannia, and Viscount, however, American and other airline officials on the scene were more interested in future versions of these aircraft. They discovered:

• **Comet**—A successor to the Comet 3 is definitely in the works. To be powered by Rolls-Royce Conway engines, the new plane will probably get a designation other than Comet 4. Officials of de Havilland insist, nevertheless, that there is nothing firmed up on the Mark 3 successor except that it will probably be capable of trans-Atlantic operations without refueling.

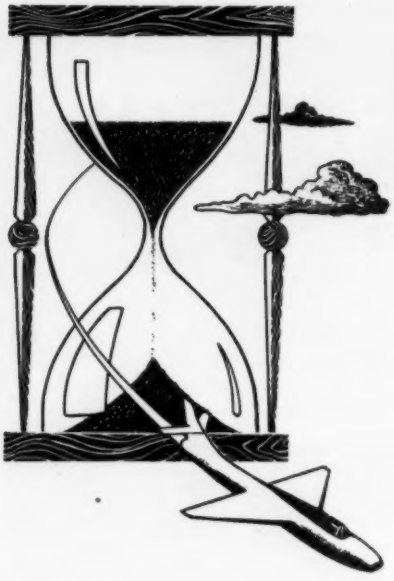
• **Britannia**—The present production version using Bristol Proteus 3 turboprops, the Britannia 100, is to be augmented by the Model 200, a freighter, the Model 250, a mixed passenger-freight airplane, and the stretched fuselage Britannia 300. In addition, Bristol is developing a two-spool turboprop from its Olympus jet which it expects to put in even later models of the 155,000-pound aircraft.

• **Viscount**—Vickers is so enthused with the sales of its current model, the 700, that it is making no firm plans for the future 800 and 900 versions until the company discovers what present operators want added. In addition to the 84 ordered (British European Airways 38, Trans-Canada 15, Air France 12, Trans-Australia six, Eire, Iraq, and British West Indies 13), before Farnborough opened, Vickers announced an additional order for 10 from an unnamed airline. • • •

NEWEST PROPOSAL for a DC-3 replacement comes from Percival Aircraft, Ltd. The pusher-engine P.87 proposal features Napier-designed turboprops.

UNDER CONSTRUCTION for the British Ministry of Supply is this 8200-pound gross weight, eight-passenger P.74. Designed by Percival, it will use a Napier low-pressure gas propulsion system which eliminates all mechanical couplings.

UNLIKE the Saunders-Roe "Princess," which is powered by 10 Proteus turboprops, the Saro "Duchess" is planned around six Ghost or Avon jets. Cruising speed would be over 500 mph with up to 90 passengers.



How AIA Would Cut Lead Time:

1. **Place advance orders**
2. **Streamline approval procedures**
3. **Improve pre-production testing**
4. **Standardize & simplify**
5. **Relax engineering restrictions**
6. **Stabilize the production base**

THE ABRUPT realization that Russia has exploded a hydrogen bomb has renewed the fears of officials and laymen alike that the recent decision to cut back and stretch out the nation's air power was untimely.

Even as the final effects of this action were being weighed, with the firm production program based on the reduced budget awaiting top U. S. Air Force approval, Air Force Chief General Nathan Twining notified the industry that additional cuts can be expected in the new budget now being prepared.

This was the setting late last month as the Aircraft Industries Association released its views on how the country can get more planes for less money and on an improved schedule. As outlined by AIA's George F. Hannaum, director of AIA industry planning service, the plan repeated some earlier pleas but also introduced some new ones:

• **Remove the artificial separation** between engineering-for-production and engineering-for-design now imposed by the restriction limiting the amount of money that can be spent on process engineering.

• **Give the manufacturer** the authority to make basic decisions on detail requirements that now require specific government approval, even when the manufacturer is the one primarily qualified to judge the need.

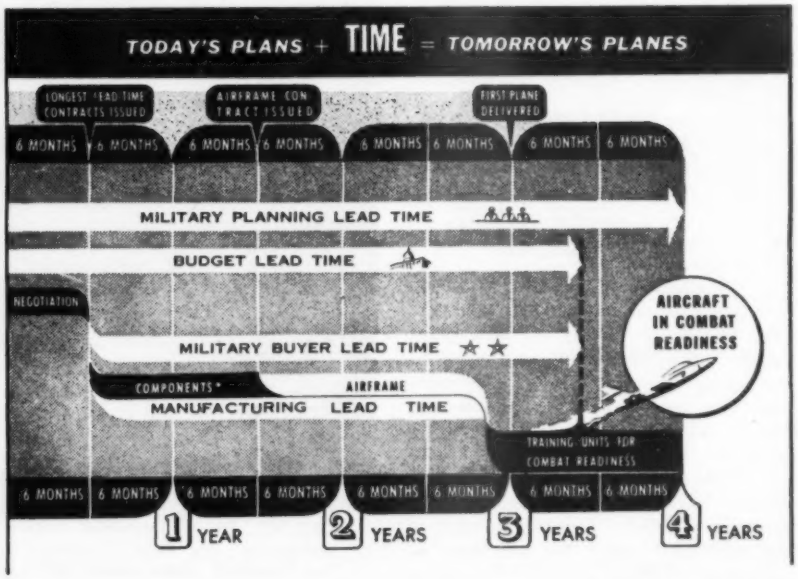
• **Provide funds in advance** of continuation orders on standard production aircraft so that long "lead time" components of the aircraft can be ordered in time to reduce total production time for the aircraft.

• **Standardize and simplify,** commensurate with performance requirements.

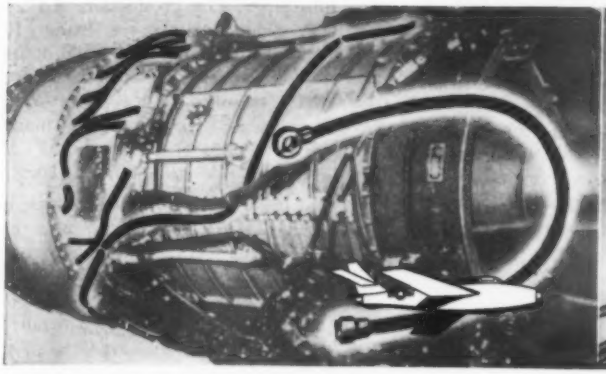
• **Stabilize production.** One of the major cost and time elements in aircraft production is the rapid expansion and contraction of industry activity to meet fluctuating concepts of the nation's peril.

Today an arbitrary ceiling is put on the amount of money the aircraft manufacturer can put into process engineering as part of his production contract. Said Hannaum: "The quickest, cheapest, and simplest way to make an important part of an experimental engine may be to machine it out of solid metal at a cost of $5,000. Such a part might be produced for $500, and in much less time, if it were cast or welded when the engine is put into high volume production. A great amount of process engineering would be required, however, to determine whether the engine would continue to operate properly under all conditions with such a cast or welded part instead of the original machined part."

This "artificial separation between engineering-for-production and engineering-for-design," Hannaum says, leads to higher costs and longer delivery schedules. It has the same result as efforts to increase production schedules by use of "such expedients as overtime labor,



Four design ideas you can use right now...



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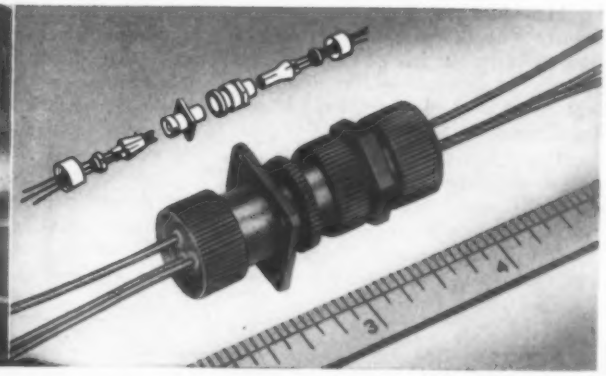

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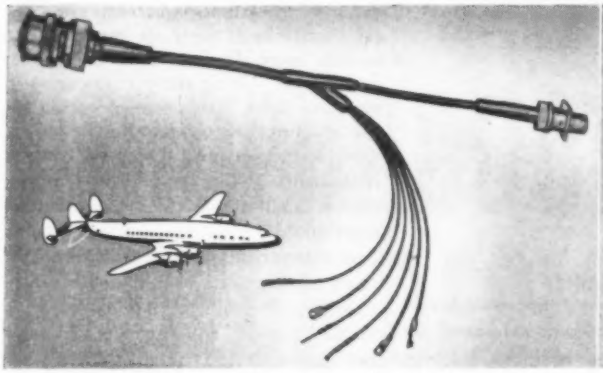

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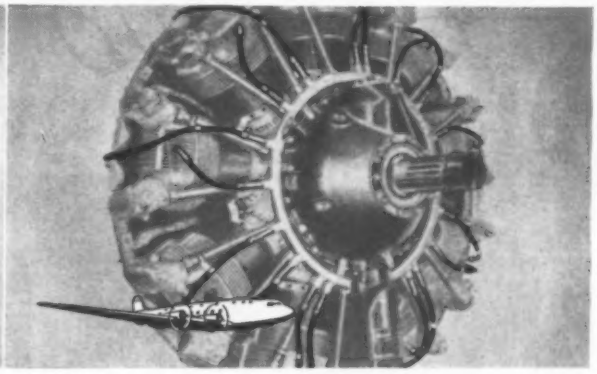

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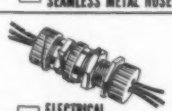

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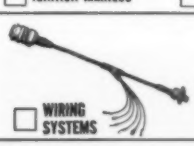

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substitute materials, inefficient makeshift tooling, or extensive modification of aircraft after they come off the assembly lines."

Hannaum cites the case of a manufacturer who needs additional machine tools to carry out his government contract as an example of the results of existing Armed Services Procurement Regulations.

Under today's regulations this contractor, regardless of his experience or record, must first get approval of the military services prior to ordering these vital machine tools. Today this is a process that may extend from one week to three months. It is consequently a big factor in determining production schedules.

While recognizing the impracticability of "freezing" aircraft designs so as to minimize change orders, Hannaum urged that "more intensive service evaluation prior to full-scale production" would do much to improve the present condition. Changes to correct engineering errors, to incorporate improved equipment, and changes to meet military theater requirements are typical of those that might be lessened with accelerated testing.

In essence this appears to be the program now being put under way by the U. S. Air Force and Republic, who are attempting to put 5000 hours service on the swept-wing F-84F before it gets into large scale production. To accomplish this Republic is using 10 F-84F's, each scheduled to log 500 hours accelerated experience. The program for the F-84F is more critical than most because the plane will be going to many NATO countries and the USAF is eager to make it a trouble-free plane.

One of the AIA proposals which is apt to get Congressional approval is the program to change the method of aircraft funding so that availability of long "lead time" items is improved. North American Aviation submitted a detailed study of this problem (AMERICAN AVIATION, June 22) to Congress during the recent hearings on PSAF budget cuts.

Landing Gear Critical

North American claimed that on the F-86 the landing gear was the critical "lead time" item. It required five months more than any other component for delivery. Using current procurement practices, the USAF does not permit the manufacturer to obligate funds for future production until the actual contract is in hand. If this were revised to provide a small fund which the manufacturer could use to reorder these landing gear components at an earlier date, the production process would not be interrupted periodically as it is today. This might require funding up to seven per cent of a year's production costs for long lead time items. It would only be practical on airplanes which were evidently going to get continuation contracts in the following year's appropriations.

Other Suggestions

Hannaum's other two suggestions are more complex: a stabilized production program for military aircraft and greater standardization and simplicity. There are some elements of the industry that feel the single prime contractor policy and weapons systems management concept will provide some improvement in standardization. The current effort to build prototype stripped down fighters like the Lockheed F-104 may provide for simplification to some degree.

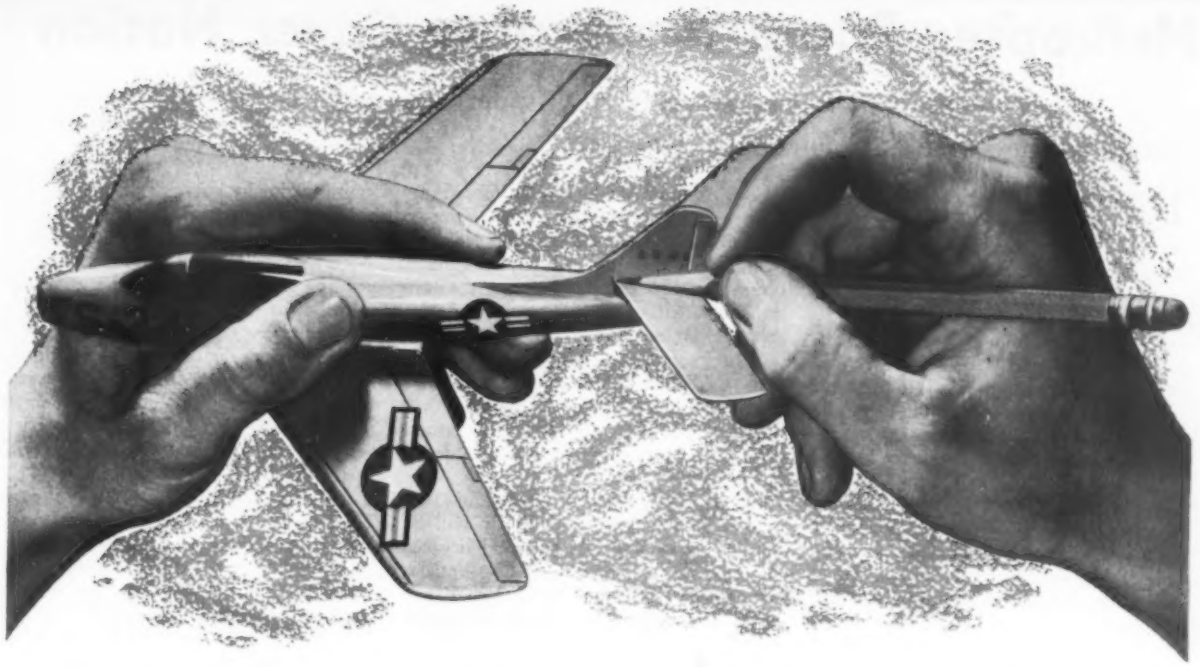
Only a basic policy change by Congressional action shows any promise of achieving a stabilized production base. Defense Secretary Wilson's intimate knowledge of production problems might lend the top level support to this type program which is needed to make it a fact. • • •

Facts and Figures!..

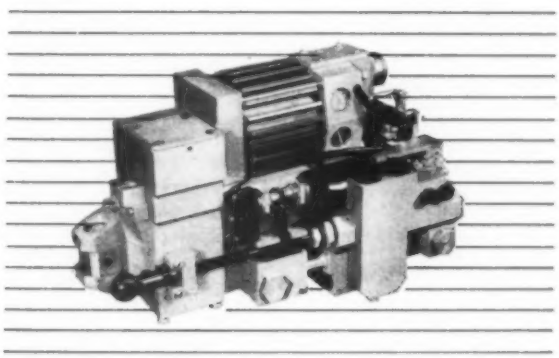
Figure:
If she'd slipped teacher an apple with a dynamite cap in it, well, that'd a been somewhat different. But when Tanna Ladd has to sit in the corner at school for an almost-nearly-normal thing like flirting with a pilot, we call it Persecution! This remorse-wracked bundle of learning is blonde, blue-eyed, 116 lbs., 5'5", and 19.

Fact:
—And, speaking of learning, you can learn a lot about the condition of your airplane with the amazing new Bendix Ignition Analyzer, aviation's newest electronic trouble-spotter. In the shop or in the air, the Bendix Ignition Analyzer means important savings in maintenance time and money. Write for literature and price.

Southwest Airmotive Company
Love Field Dallas



AEROPRODUCTS ACTUATORS RELIEVE DESIGN PROBLEMS



Aeroproducts self-locking actuators . . . by providing instantaneous adjustment of variable surfaces to any position within their designed range . . . have eliminated many previous restrictions in aircraft design. Without pre-selection or positioning, these new actuators permit variable surfaces to be locked in position and held until changed by the pilot.

Any combination of systems—hydraulic, pneumatic, electric or manual—can serve as the primary power source. These actuators can be synchronized readily in tandem or in series to provide coordinated control of related movements.

Announced uses of Aeroproducts self-locking actuators include control of the "flyable tail" of the new Republic F84F "Thunderstreak" jet fighter, the horizontal stabilizer on another high-speed jet fighter, and the afterburner of a jet engine. Additional applications include control of wing flaps, dive brakes, bomb bay or cargo doors, gun turrets, variable wing sweep and incidence, wing fold and canopy slides.

Building for today
Designing for tomorrow

GM GENERAL MOTORS

Aeroproducts

ALLISON DIVISION • GENERAL MOTORS CORPORATION
DAYTON, OHIO

Helicopter Route Applicants Cover Nation

Twenty-six areas will be served if CAB approves all requests now before it; 40 carriers involved.

THE Civil Aeronautics Board expects to make a policy ruling soon on how it will cope with the ever-increasing list of applications for helicopter certificates. At this writing, 40 different firms have filed a total of 46 applications embracing proposed helicopter operations in 26 major areas throughout the country.

Just how the agency will handle these proposals, Board members themselves are not yet sure. These courses of action are available:

• **Follow past procedure** and hold individual area proceedings as in the cases of Chicago-Los Angeles, and New York;

• **Consolidate all pending applications** into a major proceeding which would also embrace the policy issue of whether rotary-wing services should be performed by a new class of helicopter operators or by the presently certificated carriers.

In making its determination CAB is faced with contrasting pressures. On the one hand, Congress is breathing down its neck on the airline subsidy bill. On the other, Congressional elements feel that new enterprises have been virtually excluded from the air transport field since the passage of the Act in 1938.

In its recent subsidy separation report, CAB for the first time indicated that the present helicopter operators are receiving subsidy. All mail pay to such lines had previously been considered service pay.

For fiscal 1954 CAB estimates that a total of $2,325,000 in subsidy will be paid to New York Airways, Helicopter Air Service (Chicago), and Los Angeles Air Service. This, out of total mail pay of $2.6 million. Next year, CAB expects the subsidy figure to rise to $2,563,000.

Until recently all operations conducted by these lines had been in mail or property service. This summer New York Airways entered the passenger field. Apparently as a result, its subsidy needs will run $1.1 million this year and about $1.5 million next year, according to CAB estimates.

Thus when CAB has to make up its mind on the over-all problem, it will be faced with upping the subsidy bill by approximately $1 million per carrier. With service proposed for 25 areas in pending applications, the impact on the subsidy bill is readily apparent.

Based on number of applications filed, pressure is greatest for another helicopter service in San Francisco. Seven applicants have filed to operate in the San Francisco-Oakland area. St. Louis ranks next, according to this yardstick, with five applicants.

The Dallas-Ft. Worth, Washington-Baltimore, Pittsburgh, Cleveland, and Miami areas are also pressing.

They have a strong talking point: New York, Chicago, and Los Angeles have the service, why not us?

The Post Office Department is not satisfied that specialized helicopter operators are necessary for mail service. As things stand now the PO is not expected to further the cause of the would-be helicopter carriers.

But the main question appears to be not whether helicopter services will be certificated, but what type of carriers will be certificated to operate helicopters.

There are many in the local service industry who feel rotary-wing aircraft will be the ideal short-haul type plane in just a short while. Chief exponents of this theory are Mohawk Airlines, Southwest Airways, Central Airlines, and the former local service line, Wiggins Airways. All have applications before CAB.

Some trunks feel they should handle helicopter services in particular cities on their routes. One of these is Western Air Lines, whose treasurer J. J. Taylor so testified in a recent CAB hearing.

Thus thet experiment started by CAB several years ago when it certificated helicopter operators for Chicago, Los Angeles, and New York has come to a head. The carriers now operating in those cities have temporary certificates. All three expect to be in the passenger business before long on a fairly large scale.

Forty more applicants want to get in the act. The local lines and trunks are interested on their own behalf. Congress wants less subsidy but greater freedom of entry to new enterprises. The PO wants cheaper mail service. Twenty-five cities want what New York, Los Angeles, and Chicago have. And the CAB has one of its most complex problems in years to be decided.

• • •

On the Cover

EARLIER THIS MONTH, within a few days of each other, Sikorsky Aircraft Division of United Aircraft Corp. and Piasecki Helicopter Corp. both rolled out their new twin-engine helicopters. These are the helicopters that promise to make "airborne armies a reality" and which will form the foundation for the first civil passenger-carrying helicopter operation with economic aspects. They are the helicopters on which are based all the glowing reports of the helicopter's rapidly rising star.

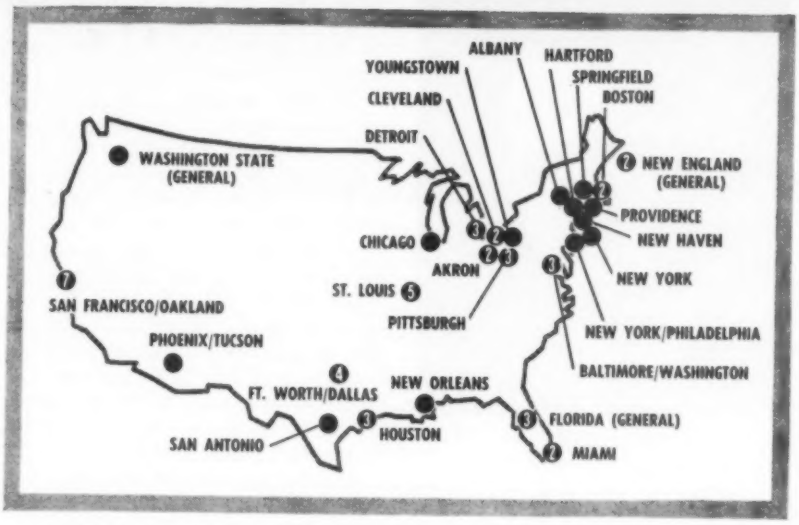
• **On September 10** the U. S. Marines released the first drawing and limited data on the XHR2S (top drawing on cover) billing it as "one of the largest and fastest helicopters *being built* today [emphasis theirs]." It will carry two squads (26 men) of fully combat equipped Marines grossing 225 pounds each, in its role as an assault helicopter.

Powered by two Pratt & Whitney R-2800 engines, rated at 1800 horsepower for this installation, the military version of Sikorsky's S-56 has a reported cruise speed of over 150 miles per hour. A later version powered by two Allison T56 engines is under consideration as a 50-passenger commercial helicopter. First flight of the XHR2S is scheduled later this year.

• **On September 13** Piasecki challenged the Marines' claims, announcing and showing the YH-16 helicopter, which it built for the U. S. Air Force as an arctic rescue helicopter. Piasecki noted that the USAF and Army have now expanded their plans for the rotorcraft. Powered by two P&W R-2180 engines rated at 1650 horsepower each, the twin-rotor YH-16 (named the "Transporter") has a 78-foot fuselage; the rotors are 82 feet in diameter. Piasecki stated it is capable of carrying 40 troops, 32 litters, or three jeeps. The Transporter will soon be followed by the YH-16A, powered by two Allison T56 turbine engines.

The YH-16 grosses more than 15 tons and in a commercial version, Piasecki claims, will seat 48 to 72 persons. Now undergoing ground tests, it will be flown as soon as these are completed.

The claim and counterclaims will remain unanswered for many months because of military security, but it seems definite that with the production of these craft large scale helicopters will have arrived.



FIGURES show number of applicants in areas where there are more than one.

The Helicopter Spreads Out

Areas for which helicopter service has been proposed and applicants for authority to provide such services (as of Sept. 1, 1953):

Total Applications 46
Total Applicants 40
Total Areas 26

San Francisco/Oakland Area
Southwest Airways
San Francisco Airways
California Central Airlines
California Helicopter Co.
Ferris S. Moulton, Jr.

Baltimore-Washington Area
Congressional Airlines
Balt. & Annapolis R. R. Co.
The Maryland Co.

St. Louis Area
BACA Airlines
St. Louis Airways
St. Louis Helicopter Service
Greater St. Louis Hel. Service
Hempel Airways

Ft. Worth/Dallas Area
R. W. Cantwell
Central Airlines
Texas Air Xebec
Leo Moss

Houston Area
Petroleum Bell-Helicopter Co.
Texas Air Xebec
Leo Moss

Miami Area
Magic City Airways
Gulf Aircraft Corp.

Florida (General)
Atlantic Airways
Southeastern Helicopter Service
Southern Air Transport

San Antonio Area
Texas Air Xebec

New Orleans Area
Petroleum Bell-Helicopter Co.

Phoenix-Tucson Area
Arizona Helicopter Service

New England Area (General)
Wiggins Airways
New England Helicopter Service

New England Area (Specific)
Boston: Skyway Corp.
Mohawk Airlines
Providence: Wiggins Airways
Hartford: Wiggins Airways
New Haven: Wiggins Airways
Springfield: Wiggins Airways

Pittsburgh Area
Miller Aviation Center
Pittsburgh Airways
Helicopter Interstate, Inc.

Detroit Area
Nationwide Airlines, Inc.
Detroit Airways
Helicopter Interstate, Inc.

Cleveland Area
Cleveland Airways
Helicopter Interstate, Inc.

Akron Area
Cleveland Airways
Helicopter Interstate, Inc.

Albany, N. Y. Area
Wiggins Airways

New York Area
Mohawk Airlines

New York-Philadelphia
Chester D. Buckland

Youngstown, O., Area
Helicopter Interstate, Inc.

Washington State (General)
Helicopter Air Lines

Chicago Area
Helicopter Air Service (add passenger rights to existing mail and property certificate)).

Industry to Fight New Flight Check Rule

Within two days of the publication of a Civil Aeronautics Board proposed ruling which would require that flight engineers be checked only by airmen holding the same certificates and ratings, the airline industry gave indication that the move would be strongly opposed. Top officials of six airlines and key Air Transport Association representatives carried the issue directly to CAB members, and sought to learn why the rule was being proposed.

The Board proposal would require the use of specially trained airmen to check out flight engineers and also institutes a flight check requirement to qualify a flight engineer for duty. CAR Part 40, previously adopted and scheduled to go into effect on October 1, also required a check, but did not specify that it be a flight check.

C-82 Modification Nears Completion

Modification of a Fairchild C-82 Flying Boxcar to meet CAA certification requirements for civilian use is nearing completion. Conducted under a small Air Force contract for $14,695 by Fairchild Engine & Airplane Co. at Hagerstown, Md., the project called for five hours of flight testing.

One of the primary reasons AF wants to stop using the C-82, sources have indicated, is lack of spare parts for the cargo transport, a condition which has hiked repair and maintenance costs. Some 160 C-82's, long out of production at Hagerstown, are still being used, out of the 220 purchased by the AF. There have been no positive indications from U. S. commercial cargo carriers regarding the desirability of using C-82's in cargo operations, although foreign carriers have reportedly shown interest.

Obituary

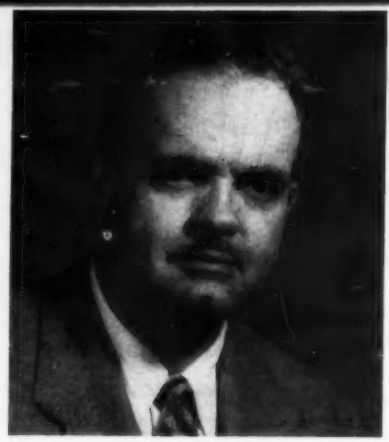
ALEXANDER McSURELY

Alexander McSurely, associate editor of *Aviation Week*, died of a heart attack at his brother's home in Madeira, Ohio, on September 15 at the age of 45.

Mr. McSurely, who had been with McGraw-Hill since 1943, was born in Hillsboro, Ohio, and was a graduate of Miami University in Oxford. He had worked on newspapers in Indianapolis and Dayton. He was a member of the National Press Club and Sigma Delta Chi, professional journalism fraternity.

He is survived by his wife, Mrs. Gertrude McSurely, two daughters, and a son.

Monte Snedeker



Henry Weeks

Future Brighter for Modified C-46's

Flight tests may begin before year's end; favorable attitude of CAA seen as good omen for program's success.

By Joseph S. Murphy

ALL SIGNS point to an early and favorable answer to that big question of what to do about the C-46 airplane. Last week the board of directors of the rejuvenated Aircraft Engineering Foundation put its stamp of approval on a fast developing corrective program, and in so doing moved the first real promise of returning the twin-engine transport to 48,000-pound passenger operation a big step nearer to reality.

The project is being spearheaded by AEC's new president, Monte Snedeker, and is finding a "new look" in cooperation from the Civil Aeronautics Administration under the personal direction of Administrator Fred B. Lee. These recent trends point to a timetable for early positive action:

• **Industry's corrective program** submitted to CAA last month (American Aviation, July 20) has brought general support from that agency. Instead of past CAA insistence on full T-category performance, some concessions are in the making, and controversies of the past will be ironed out in a new flight test program.

• **The Civil Aeronautics Board,** which holds the final say on what rules will apply to the C-46, is watching the program closely. A CAB deadline of December 31, 1953, by which the airplane is due to qualify under transport category rules, will probably be extended by early December.

• **Flight testing of a modified C-46** may begin as early as mid-December. Potential airplanes for use by the Foundation are a partially fitted test C-46 owned by the Flying Tiger Line, while the loan of another from the U. S. Air Force has been arranged by the AEC-member Aircoach Transport Association.

The key figures steering the program from here on out stand to be industry's Monte Snedeker and CAA's Henry Weeks. Snedeker, an ex-Pan American World Airways' operations official in the Latin-American division, was elected president of the Foundation several months ago, and with a background of experience in C-46 operation and engineering while at PAA, he directs all phases of the plan which will decide the fate of C-46's in airline operation today.

CAA's Henry Weeks, who came to the top Washington post in aircraft engineering two months ago, brings a fresh CAA approach to the C-46 issue. With safety director Alfred S. Koch's new policy of delegating greater authority to division heads in safety, Weeks will be calling the CAA signals for the handling of this program.

Under the plan sent to CAA by Snedeker, aircraft modification is but one important phase. Other points:

• **Organization for compliance:** The Foundation becomes responsible for assuring that its members comply with the program, and eligibility for continued membership in AEC will depend upon such compliance.

• **Operating and maintenance standards:** Long needed operations and maintenance manuals setting standards of fitness for the airplane and its operation will be prepared. Work is expected to start on this phase in a matter of weeks, with two representatives from each of the four airline associations in the Foundation contributing their technical know-how to the project.

• **Crew training:** One plan is to use several teams of experienced C-46 flight instructors and hold a classroom review and flight instruction program for all C-46 pilots. Activity in this phase is set to begin within 30 to 60 days.

The modification being planned for the C-46 is not the $100,000 affair talked of last year, which called for new engines and greater power. AEC's plan is aimed instead directly at fixing the causes of past C-46 accidents and includes nacelle alterations for better engine cooling and improved protection against engine fires.

One cockpit change will bring new instrumentation to indicate the optimum speed for given flight conditions; another will virtually eliminate the possibility of inadvertent landing gear retraction or forgetting to lower the gear, both factors in past C-46 accidents.

In selling the "corrective program" to CAA, Foundation officials pointed out that 37 out of a total of 127 major C-46 accidents probably would not have occurred at all had the program been in effect at the time. They also indicated that the chance of accident would have been reduced in 74 other cases.

One phase of industry's program aims to fill a long-standing void in the C-46 picture. The Foundation now assumes responsibility for providing a technical sponsor for the airplane in much the same manner as an aircraft manufacturer does for other transports.

In this activity AEC will hold the new type certificate issued for the C-46 when flight testing is completed and performance limitations are set. This role also brings the permanent assignment of liaison with CAA on C-46 airworthiness, and the responsibility for originating and distributing airworthiness information and directives such as are now issued by airframe manufacturers.

A large measure of AEC's success in organizing the C-46 program in the short span of four months is due to the complete support it has mustered from industry. The united effort put forth by all operators of C-46's in the U.S. is an impressive one. Past efforts to resolve the C-46 issue have suffered from lack of such support and a similar lack of supporting funds, but with AEC funding at a peak (each member is assessed $50 per plane per month) the problems of the past are gone, and the signs all point to a brighter future for the C-46. • • •

Evaluating the Evaluators

IN A HIGHLY GUARDED section of the Pentagon, some 40 military officers and civilian scientists are working together to analyze projected conditions of war and to recommend weapons this country should have to meet combat requirements years away. These men form the Weapons Systems Evaluation Group (WSEG), whose studies have important bearing on long range aircraft procurement planning. At the moment the organizational status of this group is at a crossroads due to the following conditions prevailing in the Pentagon:

Ill Winds

• **The work of new assistant defense secretaries** for research and development (Donald A. Quarles) and for applications engineering (Frank D. Newbury) could well parallel or perhaps supersede the function of WSEG.

• **The group has been a recent target** of criticism, having been charged with lack of uniform objectivity and effectiveness in some of its studies.

• **The group's precise role** under new Office of Secretary of Defense (OSD) leadership has never been spelled out, and it has been functioning under its original charter written five years ago.

• **Abolishment by OSD of the Research and Development Board,** for which WSEG did a great deal of its work, gives an indication of forthcoming alterations down the line.

With the R&D Board gone, WSEG now tackles weapons study projects for OSD and the Joint Chiefs of Staff (JCS). When either of these highest defense planning units has a problem for WSEG, the group is ready to dig into it with its well-rounded staff of military and civilian experts representing all the services.

Various Projects

The types of such projects vary considerably, some requiring years of exploration. They are always highly classified since they involve top level, and often controversial, thinking about the nation's future combat hardware, such as atomic aircraft, supersonic bombers and fighters, guided missiles, aircraft carriers, atomic artillery, and weapons with which the outside world is entirely unfamiliar.

Although the group has authority to generate projects of its own, Pentagon sources indicate that no WSEG-inspired projects have been undertaken, presumably because the group has been well supplied with work from topside.

Forthcoming changes in the weapons study unit, if they materialize, will most likely be prompted by OSD action, not JCS desire. Adm. Arthur W. Radford, new JCS chairman, has stated that he has no plans in mind for altering or eliminating WSEG. He said he has been impressed by the group's studies.

Most recent blast at the group came from the Air Force Association, which charged it with lack of objectiveness and overall effectiveness and noted that the military dominance in its organization has brought about emphasis of individual service rather than national interests. To eliminate inter-service rivalries in weapons evaluation, AFA recommended the job be taken over by an independent commission of leading civilians.

Although there is nothing to indicate that the AFA proposal has made a mark on Pentagon planning, WSEG could well be relegated to a level beneath either Assistant Defense Secretary Newbury or Quarles, or perhaps both, giving it some of the civilian control called for by AFA.

Shaky Position

The WSEG staff is aware of its shaky position, and members are wondering what the current status of their organization actually is. There is a question as to whether WSEG is being properly utilized by the new OSD and JCS teams. It would not be surprising to learn that neither Defense Secretary Charles E. Wilson nor Radford has sent the group recent projects for study.

Military dominance and inter-service rivalry have not been factors in its operation, WSEG officials say. Although it is headed by Army Lt. Gen. Geoffrey Keyes, its chief scientific official is a civilian, and some 20 civilian scientists comprise half the group's 40 technical members. Dr. E. Bright Wilson, Jr., just left the post of research director (which also includes the job of WSEG deputy director) after serving his period of appointment. Dr. Wilson, professor of physical chemistry at Harvard, returned to the university. Dr. George I. Welch, a permanent civilian member of the group, has taken over Dr. Wilson's position until the appointment of a new research director.

Not a deep-rooted Pentagon agency, WSEG was established by charter on December 11, 1948, by the eliminated R&D Board and JCS. It got into full operation early in 1949. The group was designed to supply technical evaluation for all of the armed services and, as the charter reads, "to provide rigorous, unprejudiced, and independent analyses and evaluations of present and future weapons systems under probable future combat conditions, prepared by the ablest professional minds, military and civilian, and the most advanced analytical methods that can be brought to bear."

. . . HARRY S. BAER, JR.

The Experiment Begins: First Class by Air

One-year trial period will test service on space-available basis; four scheduled carriers lined up.

By Eric Bramley

EXPERIMENTAL carriage of first-class mail by air over two of the nation's major air routes was scheduled to get under way toward the end of September.

Four scheduled airlines (United, American, TWA, and Capital) are expected to participate in the one-year trials carrying 3c letters between New York/Newark and Chicago and Washington-Chicago. Whether certificated freight lines and non-scheduled carriers will be included was yet to be determined as this issue went to press.

There was hope that the experiments would eventually lead to nationwide carriage of all long-haul first-class mail by air—a new class of business and a new source of revenue for the carriers. On the other hand, there was fear that airlines' pay for carrying air mail might be cut. These lines were also faced with the possibility of entry of the non-skeds into the mail field.

A minimum of 10,000 tons of first-class mail a year (2,000,000 letters daily) is expected to move by air over the two routes. Participating airlines will divide at least $1,300,000 a year in revenue.

The airlines' pay for hauling this mail—proposed by the Post Office and approved by CAB—will be 18.6c per ton-mile New York-Chicago and 20.04c Washington-Chicago. This compares with 45c per ton-mile received by the larger carriers for air mail.

Opinion in the scheduled industry is that 18.6c and 20.04c is too low. Some carriers had proposed from 30c to 32c New York-Chicago, for example. However, they agreed to go along for purposes of the experiment. First to accept was United, followed by American and TWA. Capital is expected to follow.

The PO's explanation of the rates was that it could not justify paying more to have the mail flown than it paid for rail carriage. After conducting tests, it estimated its overall yearly rail cost and offered the airlines rates which would not exceed this figure. It further argued that such rates, which it said are "consistent with air freight volume rates" were justified because they were for space that would otherwise be flown empty (first-class mail is to move on a "space available" basis within certain time limits to be set by the PO).

Early acceptance of the PO proposal came from Slick Airways and the Flying Tiger Line, certificated freight carriers. Aircoach Transport Association, composed principally of irregulars, said its members would carry mail for 15½c a ton-mile New York-Chicago and 17½c Washington-Chicago in C-46 planeload lots, provided that aircraft were used in round-trip operation 25 days monthly. On the same basis, DC-3 prices would be 17½c and 19½c, respectively. For less than planeloads, ACTA proposed 16c and 18c for C-46's.

The freight lines and non-scheduled carriers were waging an all-out battle to participate in the experiments. They reportedly have found a sympathetic ear in the PO. Not now certificated for mail, these lines were pushing CAB for (1) an exemption to carry mail, (2) a ruling that mail could be carried as "property," or (3) permission to contract with the PO. Whether CAB decides to act on any of the alternatives remains to be seen. Opposition is expected from scheduled lines.

Less Service Pay?

The scheduled industry is also speculating that before long the PO, having obtained 18.6c and 20.04c rates for first-class mail, will claim that the airlines' non-subsidy "service" pay for hauling air mail is too high. Since service rates are now paid by the PO and subsidy by CAB, any downward adjustment in service pay would mean less out of the PO's pocket and more out of CAB's.

A hint that there may be a move in this direction was dropped at Postmaster General Arthur Summerfield's press conference announcing the experiments. A reporter commented that there was a lot of difference between 18.6c for first-class mail and 45c for air mail. Summerfield replied: "I thought you might take note of that."

The PO faces the possibility—which it is inclined to minimize—that its air mail revenues will drop when the public discovers that its letters will fly for three cents instead of six cents. The PO said a three cent stamp did not *guarantee* that a letter would fly—if space were not available it might go by rail. However, its estimate of New York-Chicago weekday mail was 10 tons westbound daily and 13.9 tons eastbound—volume that the airlines can easily handle.

As the experiment progresses, this volume may increase because the PO plans to include mail destined for points beyond Chicago. New York-west coast letters, for example, will be flown to Chicago and carried onward by rail. Also, mail from areas surrounding New York will be included.

Other "preferential mail" will eventually move by air during the experiments. The PO defines this as mail that has a time value and which is now transported in railway mail cars. Newspapers were given as an example.

On the cost side, the PO estimated that New York-Chicago first-class mail by railroad cost it $1,477,310 yearly. Of this, $1,004,030 was for distributing space and manpower, while $473,230 was transportation. It further estimated that for an air operation, distribution and manpower would cost only $479,548 because space and manpower "on the ground" would be less expensive than in railway mail cars.

Thus, it offered to pay the airlines the difference between $479,548 and $1,477,310, the total rail cost. This worked out to 18.6c per ton-mile. The same method was used to compute the 20.04c Washington-Chicago rate. Compensation to airlines would be $997,762 yearly New York-Chicago, $375,820 Washington-Chicago, or a total of $1,373,582.

The PO said movement of first-class mail by air will be subject to the following conditions:

• **It will be subject to prior movement** of all air mail, passengers, and air express. If any or all of such mail has not been dispatched by the carrier within such time period as may be established by the PO, the carrier shall notify the Department, and if the carrier or the Department so elects, such mail shall be returned by the carrier to the custody of the postal service at the place where the initial delivery was made, without penalty to the carrier.

• **Any authorized air carrier may decline** to inaugurate service at such rate, or, after inaugurating service, may, upon 30 days' written notice to the PO, decline to carry such mail at such rate.

• **The PO also has a 30-day** cancellation privilege. "Except as may be required in the interest of the expeditious movement of the mail, the Department shall not discontinue offering said mail to any one or more authorized carriers which are willing to transport it at the said rate, unless the Department discontinues completely the offering of any such mail to all such authorized carriers." • • •

NEW TERMINAL BUILDING AT MADRID'S BARAJAS AIRPORT will feature separation of domestic and international traffic. It should be completed within about a year.

Spanish Lines Prepare for New Equipment

Aircraft have covered wide variety of shapes and sizes in the past; Iberia and Aviaco constitute industry.

By Anthony Vandyk

This is the second of two articles by American Aviation's International Editor on Spanish aviation. The first, published in the September 14 issue, described Spain's aircraft industry.

MADRID, SPAIN—Few airline men are better qualified to discuss transport aircraft than Spanish airline men. In the past they have had experience with such varied types as the Fokker F.VIIB, the Ford Trimotor, the Junkers G.24, and the Douglas DC-2. Today they are operating DC-3's, DC-4's, SNCASE Languedocs, de Havilland Dragon Rapides, Bristol 170's, and Junkers Ju.52's. Next year they will have Super Constellations and probably Convair 340's.

Since 1921 when the first Spanish airline—CETA—was established, Spain's transport aircraft have been flying in the markings of many companies, including those of UAE (1925), Iberia (1927), CLASSA (1929), LAPE (1932), Iberia (1940), and Aviacion y Comercio (1948). The two Iberia companies, incidentally, are connected only in name. Today the Spanish air transport industry comprises two companies —the state-controlled Iberia and the privately owned Aviacion y Comercio (Aviaco).

The precise status of Aviaco is a delicate subject for discussion since legally Iberia holds the exclusive right to operate Spain's scheduled domestic and international air services until 1960. Nevertheless, Aviaco is operating domestic routes with government authorization and is also serving several points outside Spain, including a route to Brussels and Amsterdam operated in pool with KLM and SABENA.

In the past, with one exception, Iberia has tolerated Aviaco's operations since it has been in no position as far as equipment is concerned to take over the services itself. The exception was a route from Spain to West Africa pioneered by Aviaco. In 1952 Iberia started a more direct service between the same points using superior equipment, and Aviaco thereupon suspended its operations to West Africa.

Although there have often been talks of a merger, observers believe that the Spanish government will allow Aviaco to stay in existence provided it does not jeopardize Iberia's operations. That opinion is apparently shared by Philippine Air Lines, which is seeking Spanish government approval to acquire 25% of Aviaco's stock in return for the supply of transport aircraft—DC-3's or Convair 340's.

Aviaco badly needs modern equipment but to date has been unable to secure foreign currency to buy in the United States. The airline operates a fleet of three four-engine Languedocs (with 44 seats for domestic services and 33 for international flights) bought from Air France "at an extremely favorable price" and eight 44-seat twin-engine Bristol 170's. These planes go to France and England, respectively, for major overhauls.

Iberia is in a better position on equipment than Aviaco, but Spain's dollar shortage is a constant hindrance to the company, since American equip-

SIX DC-4's operate Iberia's long-distance services to the Caribbean area, South America, West Africa, the Cape Verde islands, and within Europe.

THREE LANGUEDOCS, built in France by SNCASE, are a recent addition to the Aviaco fleet. They carry 44 passengers on domestic routes and 33 on international services.

ment is used predominantly. In order to cut dollar imports to the minimum, Iberia even makes certain spare parts for its DC-3's in its shops at Barajas airport, Madrid. The present Iberia fleet comprises six DC-4's, 16 DC-3's, four Bristol 170's, three Dragon Rapides, two Ju.52's, two Airspeed Consuls, and four Stinson Station Wagons. Scheduled for delivery next spring are three Super Constellations.

The Super Connie equipment will enable Iberia to expand its international operations to New York and to the west coast of South America. At the moment the airline operates three trans-Atlantic routes: to Havana; to San Juan and Caracas; and to Natal, Rio de Janeiro, and Buenos Aires. In Europe the company flies to London, Paris, Geneva, Frankfurt, and Lisbon, in addition to its domestic services. Iberia also serves Tangier, West Africa, and the Cape Verde Islands.

Unlike other European carriers both Iberia and Aviaco make most of their money (both operate well in the black) on domestic routes. Load factors are high throughout the year due to Spain's poor surface transportation—the railroads are in bad shape and there are virtually no long-distance buses.

In 1952 Iberia alone carried 82,666 passengers between Madrid and Barcelona, the two principal Spanish cities, while between Barcelona and the vacation island of Palma de Majorca it transported 91,880 travelers. Many of the Spanish airlines' passengers are foreigners attracted to Spain by the low cost of living. This summer Spain was easily Western Europe's cheapest vacation spot.

Few International Routes

Most foreigners traveling to Spain by air do not use Iberia or Aviaco, since the Spanish companies have relatively few international routes and fly less frequently than foreign airlines. Air France, BEA, and TWA are the big three among the foreign carriers in Spain. Spanish legislation and currency regulations do not make life easy for the foreign airlines. A separate company has to be registered in Spain and revenue earned cannot normally be converted into foreign currencies.

Spanish red tape hurts the Spanish airlines almost as much as it does the foreign carriers, and consequently both Iberia and Aviaco have joined an association of airlines operating in Spain known as Asociacion de Lineas Aereas. This non-profit organization groups 18 carriers and is intended to be a link between the operators and the various official and semi-official government agencies.

Under the chairmanship of TWA's Frank Howell, the association has already achieved several results and is currently working in a number of fields. It is, for instance, trying to secure elimination of the examination of outgoing baggage; introduction of a standard embarkation/disembarkation card; improvement of sanitary facilities at Madrid's Barajas airport; and revision of the present regulation that all Spanish emigrants must travel by sea.

The association has been consulted by the Spanish authorities in the development program for Barajas, which will soon be one of the finest fields in Europe. In addition to a vast new terminal building to be used by all carriers, there are hangars and overhaul and engine test facilities under construction for Iberia to replace the present inadequate shops.

Another large overhaul facility that is being built at Barajas will be used by a company known as Talleres Aeronauticas de Barajas, with 75% participation by Aviaco and 25% by Britain's Bristol Aeroplane Company. Initially it will overhaul the Hercules engines used in Aviaco's and Iberia's Bristol 170's.

It is too early to know what effect the forthcoming U.S. aid program to Spain will have on civil aviation. Undoubtedly all airlines serving Spain will get additional business from the general increase in travel to and from the country in connection with the program. They should also be able to benefit from the navigational and communications equipment to be supplied under the military portion of the program. Economically the program should make it easier for Iberia and Aviaco to buy U.S. aircraft and spares. The future was never brighter for Spanish civil aviation.

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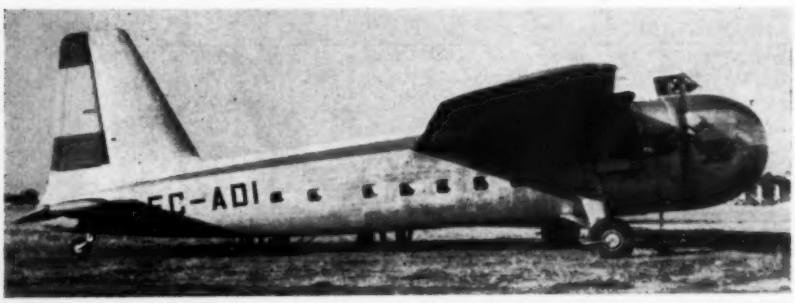
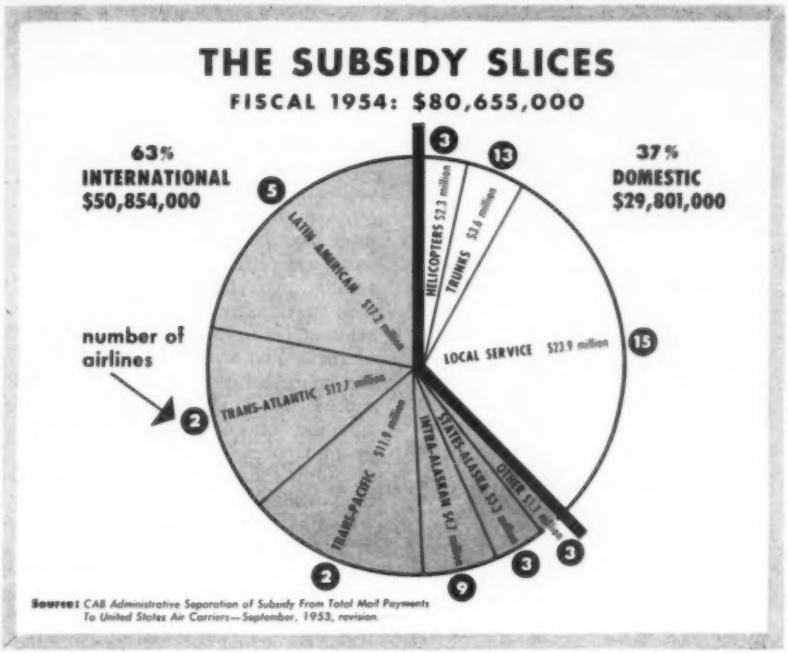


BRISTOL 170's are used by both Iberia and Aviaco on domestic routes. Passengers like the capacious cabin and the good view resulting from the high-wing configuration.

Magazine Wins Award

The Direct Mail Advertising Association has awarded AMERICAN AVIATION first place in its annual "Best of Industry" contest under the classification of "Publishers: Magazines and Newspapers, Circulation." The award was based upon the effectiveness, appearance and integration of a group of circulation promotion letters.



Subsidy Pay: New Rules All Around

Limelight of publicity will be on service pay and subsidies; Congress may want some questions answered.

By William V. Henzey

WHEN CAB ISSUED its newly revised subsidy separation report early this month, it was cutting the cards for a three-way game involving stakes of some $136 million and perhaps the financial stability of many of the 40-odd certificated U. S. airlines. Participants are the Board itself, the Post Office, and Congress.

The game is to be played under new rules necessitated by the President's Reorganization Plan No. 10, which on October 1 transfers the responsibility for paying subsidies from the PO to the CAB.

In the initial shuffle, the PO is called upon to pay the airlines $56,070,000 for transporting 101,151,000 ton-miles of U. S. mail during fiscal year 1954. CAB accepted a tab of $80,655,000 to be paid, the Act says, to "develop and foster a sound air transport system." Until now, the PO footed the entire bill.

Because Congress, the keeper of the purse, acted on the current year's appropriation before the new rules became effective, the only immediate changes to result will be of a mechanical nature. CAB, for example, will begin meeting airlines' monthly claims for subsidy; the PO will reduce its function to the paying of airlines' monthly claims for service pay only.

But by next spring things should be different. For then, using the figures contained in its new report, subject only to necessary modifications that time may occasion, CAB will be called upon to answer to Congressional appropriation committees for specific subsidy amounts paid to specific airlines.

The agency also will have to explain specific subsidy for specific areas. With an economy-minded Congress and an economy-minded Administration, this could prove to be an area vulnerable to axe-wielding.

Then too, the Post Office, perhaps more dynamic under Postmaster General Arthur Summerfield than at any time since the days of Walter Folger Brown and Jim Farley, is expected to go to work on the rates CAB has designated as "service" rates.

The tip-off on this may be the new "experiment" in the New York-Chicago and Washington-Chicago areas, where Summerfield has managed to push through rates such as 18.6¢ and 20.4¢ per ton-mile for the airlines to carry first-class mail on a "space-available" basis. When it is considered that airline service rates for carrying airmail range from 45¢ to $2.58 per ton-mile now, the thinking of the PO becomes clearer.

When and how the PO will make its next move in this direction is not known. Generally considered the most effective such move that could be made is for Summerfield to "challenge" current service rates by filing appropriate petitions with CAB.

The effect of such petitions would be to "reopen" what are now considered "final" or "permanent" mail rates, placing them on a temporary basis and subject to adjustment retroactive to the date of challenge. Thus, assuming the PO made such a challenge on October 1, and was successful through the course of CAB proceedings in securing a reduction in service rates to, say 25¢ a ton-mile, the rate would apply from October 1, and the present CAB rates would be discarded.

But CAB, charged by law with establishing "reasonable rates" for the furtherance of the industry, quite aside from the air mail service, would have an entirely new problem.

It must be assumed that the current $136,000,000 mail bill reflects what CAB considers a necessary "reasonable" amount for the industry. If the PO, whose share of that bill is $56,070,000 this year, manages a reduction, then the amount reduced would go on the subsidy side of the ledger and the CAB subsidy bill would reflect a corresponding increase.

This very real possibility plus the fact CAB will meet Congress face-to-face on subsidy appropriations adds up, even in the minds of some Board members, to a potential psychological change in CAB's determination of "reasonable" rates.

Here's how one prominent CAB official puts it: "The Board in the past has fixed rates with the vague knowledge usually that the Government will fork over. But with the responsibility for such rates now assuming a more personal note, a new type of tighter thinking could prevail even in the fixing of rates."

The subsidy and service mail pay figures used herein, being for the current fiscal year, have been approved by Congress, but under the old rules whereby the PO asked for and got the total sum. CAB estimates little or no change in the amounts for fiscal 1955 when the PO requests only the service total and CAB for the first time supports the subsidy request.

What, therefore, will Congress have to look forward to? For one thing it will be told that $50.8 million of the total subsidy bill goes for international, overseas, and territorial air services by U. S. carriers. Some $23.8 million is for the local service airline industry, $2.3

Estimated Mail Service Pay

U. S. Airlines, Fiscal 1954

		Amount	Rate Per Ton-Mile
1.	Pan American	$10,995,000	47c-59c-67c-85c
2.	United	10,379,000	45c
3.	TWA	9,333,000	45c-85c
4.	American	8,518,000	45c
5.	Eastern	3,037,000	45c
6.	Northwest	2,916,000	53c-67c
7.	Delta/C&S	1,678,000	53c-88c
8.	Braniff	1,646,000	53c-88c
9.	Capital	1,174,000	53c
10.	National	838,000	53c
11.	Western	822,000	53c
12.	Pacific Northern	500,000	47c-129c
13.	Alaska Airlines	463,000	47c-129c
14.	Continental	371,000	75c
15.	Panagra	335,000	88c
16.	Wien Alaska	294,000	129c
17.	Reeve	265,000	250c
18.	Northern Consolidated	258,000	129c
19.	North Central	186,000	148c
20.	Southern	141,000	148c
21.	Los Angeles Airways	134,000	258c
22.	Colonial	129,000	75c
23.	New York Airways	124,000	258c
24.	Allegheny	118,000	148c
25.	Trans-Texas	118,000	148c
26.	Northeast	116,000	75c
27.	Central	116,000	258c
28.	Pioneer	113,000	75c
29.	Alaska Coastal	113,000	250c
30.	Frontier	107,000	91c
31.	Southwest	90,000	91c
32.	Ozark	89,000	148c
33.	Piedmont	83,000	75c
34.	Helicopter Air Service	83,000	258c
35.	Lake Central	75,000	258c
36.	West Coast	59,000	148c
37.	Mohawk	45,000	91c
38.	Ellis	45,000	250c
39.	Bonanza	41,000	148c
40.	Cordova	35,000	250c
41.	Hawaiian	30,000	81c
42.	Caribbean-Atlantic	21,000	138c
43.	Byers	20,000	250c
44.	Trans-Pacific	16,000	81c
45.	(Wiggins)	1,000	726c
	TOTAL	$56,070,000	

Estimated Subsidy

U. S. Airlines, Fiscal 1954

1.	Pan American		$28,667,000
2.	TWA	(I)	4,487,000
3.	Northwest	(I)	3,961,000
4.	Braniff	(I-D)	3,454,000
5.	Frontier		2,908,000
6.	Trans-Texas		2,582,000
7.	North Central		2,514,000
8.	Panagra		2,167,000
9.	Alaska		2,157,000
10.	Ozark		2,011,000
11.	Southern		1,813,000
12.	Allegheny		1,792,000
13.	Northeast		1,619,000
14.	Central		1,676,000
15.	West Coast		1,556,000
16.	Piedmont		1,552,000
17.	Lake Central		1,475,000
18.	Wien Alaska		1,206,000
19.	Pacific Northern		1,202,000
20.	New York Airways		1,126,000
21.	Southwest		1,110,000
22.	Northern Consolidated		1,088,000
23.	Pioneer		1,024,000
24.	Mohawk		955,000
25.	Bonanza		904,000
26.	Colonial	(I-D)	811,000
27.	Los Angeles Airways		766,000
28.	Delta/C&S	(I)	741,000
29.	Continental		695,000
30.	Hawaiian		584,000
31.	Trans Pacific		454,000
32.	Helicopter Air Service		433,000
33.	Cordova Air Service		332,000
34.	Alaska Coastal		329,000
35.	Ellis Air Service		254,000
36.	Caribbean-Atlantic		142,000
37.	Byers Airways		47,000
38.	Reeve		38,000
39.	(Wiggins)		23,000
40.	AA, CAP, EAL, NAL, UAL, and WAL		zero
	TOTAL		$80,655,000

(I)—International division only.
(I-D)—International and domestic.
- - - Where more than one rate per ton-mile is shown, it means that carrier operates in more than one area and has a separate rate for each area.
(Wiggins)—Wiggins Airways ceased operations August 1, 1953; figures shown consequently represent only one month of the current fiscal year.

million is for the helicopter experiment, and the remainder of $3.5 million is split among four domestic trunk carriers.

The Congress, of course, has been made well aware that nine of the major trunks in the U. S. get no subsidy under CAB's current separation method.

Or the legislative body may get more specific. It may wonder why a local service line, Frontier, gets more subsidy than Eastern Air Lines' total mail pay, since Eastern is the fifth-ranking U. S. carrier in the movement of mail. You would have to disbelieve the policy behind the local service concept to be critical of Frontier in this situation, but how deep will Congress go into policy?

Or some member of an appropriations committee may not understand why Pan American gets over one-third of all subsidy paid to U. S. airlines. It may not be readily understood that such a figure covers Pan Am's far-flung operations across both the Atlantic and Pacific oceans, in Alaska, and in Latin

Estimated Mail Ton-Miles

U. S. Airlines, Fiscal 1954

1.	United	23,064,000
2.	American	18,928,000
3.	TWA	16,544,000
4.	Pan American	15,277,000
5.	Eastern	6,748,000
6.	Northwest	5,114,000
7.	Delta/C&S	3,122,000
8.	Braniff	2,696,000
9.	Capital	2,215,000
10.	National	1,580,000
11.	Western	1,550,000
12.	Pacific Northern	673,000
13.	Alaska Airlines	505,000
14.	Continental	495,000
15.	Panagra	381,000
16.	Wien Alaska	228,000
17.	Northern Consolidated	200,000
18.	Colonial	171,000
19.	Northeast	155,000
20.	Pioneer	150,000
21.	North Central	126,000
22.	Frontier	118,000
23.	Piedmont	111,000
24.	Reeve	106,000
25.	Southwest	99,000
26.	Southern	95,000
27.	Allegheny	80,000
28.	Trans-Texas	80,000
29.	Ozark	60,000
30.	Los Angeles Airways	52,000
31.	Mohawk	49,000
32.	New York Airways	48,000
33.	Central	45,000
34.	Alaska Coastal	45,000
35.	West Coast	40,000
36.	Hawaiian	37,000
37.	Helicopter Air Serv.	32,000
38.	Lake Central	29,000
39.	Bonanza	28,000
40.	Trans-Pacific	20,000
41.	Ellis	18,000
42.	Caribbean-Atlantic	15,000
43.	Cordova	14,000
44.	Byers	8,000
45.	(Wiggins)	90
	TOTAL	101,151,000

America. It may even lead to more open probes of Pan Am's complaints of too much competition in the international fields it serves.

Or the PO, with its $56 million bill, may complain that CAB is causing it to pay more for experimental helicopter mail service in one city than it pays for fixed-wing local or trunk service to 15 or 20 cities. Or it may stimulate further study of the present situation, where one carrier carries mail for 45¢ a ton-mile between a pair of points and another for 53¢ between the same points. Or, why 81¢ in Hawaii and $2.50 in Alaska?

There are answers to all these questions. But they were prepared and submitted under the old rules. Now the game is changed and an anxious industry waits to see how the cards are played. • • •

Fairchild to Set Up European Subsidiary

A third major U. S. aircraft company will set up a wholly owned European subsidiary soon. Following the lead of Republic Aviation Corp. (Republic Aviation International at Lugano, Switzerland) and Curtiss-Wright Corp. (Curtiss-Wright Europa, N.V. at Amsterdam, Holland) will be Fairchild Engine & Airplane Corp. which will establish Fairchild Aviation, N.V., at Amsterdam.

Fairchild's Dutch firm expects to obtain contracts from the USAF in Europe for parts, service, and maintenance for the C-119 Flying Boxcars being operated in the European theater.

Fokker Aircraft Co. of Amsterdam will be the principal subcontractor.

New ATA Members; Deadlock on President

The Air Transport Association board of directors in recent meeting elected three new members, namely West Coast Airlines, New York Airways, and Mackey Air Transport. The board also voted $12,500 toward preparing a proposed design and site for the National Air Museum to match a similar sum voted by the Aircraft Industries Association, and referred back to the Air Traffic Conference the question of handling a pending Civil Aeronautics Board investigation into proposed changes in payment of commissions to domestic travel agents.

The ATA board did not act on a new president to succeed Emory S. Land. A committee of airline presidents headed by T. E. Braniff, charged with selecting a presidential candidate for recommendation to the board, was unable to reach agreement.

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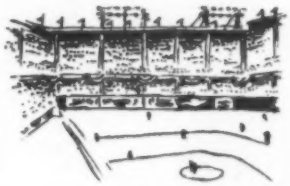
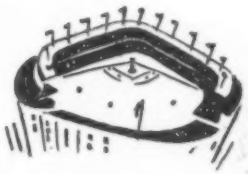


* ALLIED Maintains Ebbets Field (Home of the Brooklyn Dodgers)



* ALLIED Maintains Yankee Stadium (Home of the New York Yankees)

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There's little physical resemblance between the first automatic aerial torpedo of World War I and the guided missiles of today. Yet both were made possible by the gyroscopic principles developed by Sperry.

When the automatic flying torpedo took to the air, it was kept on its predetermined course with a Sperry Automatic Pilot. Today, combined with radio, principles of those early flights are incorporated in the compact, sensitive Sperry controls that form the brains of supersonic rockets, experimental drone aircraft and guided missiles.

What new developments lie ahead in the field of pilotless flight? No one knows. But you can be sure of this—as improvement follows improvement, Sperry engineers will be applying the "know how" and experience acquired during more than 40 years of leadership in aviation.

...American military scientists for launching from a V-2 rocket, first used compact Sperry control mechanism to guide it.

1951 Sperry E-4 Automatic Pilot converted Lockheed jet fighter to automatically controlled drone, permitting command from ground or from EDT-33 Director plane. Such robots served as targets in evaluating missiles and gathered data by penetrating atomic blasts.

1953 Guided missiles, such as the Navy's Regulus, designed by Chance Vought, are directed in flight by Sperry controls combined with highly developed radio. From controls and guidance systems to complete "birds," Sperry is designing and producing missiles for the national defense.

19?? For as long as there is a need, Sperry's engineering, research, and manufacturing facilities are at the command of the Armed Forces. And through licensing arrangements, Sperry has been proud to share its developments with others – to give the Services more Sperry-designed equipment in the shortest possible time.

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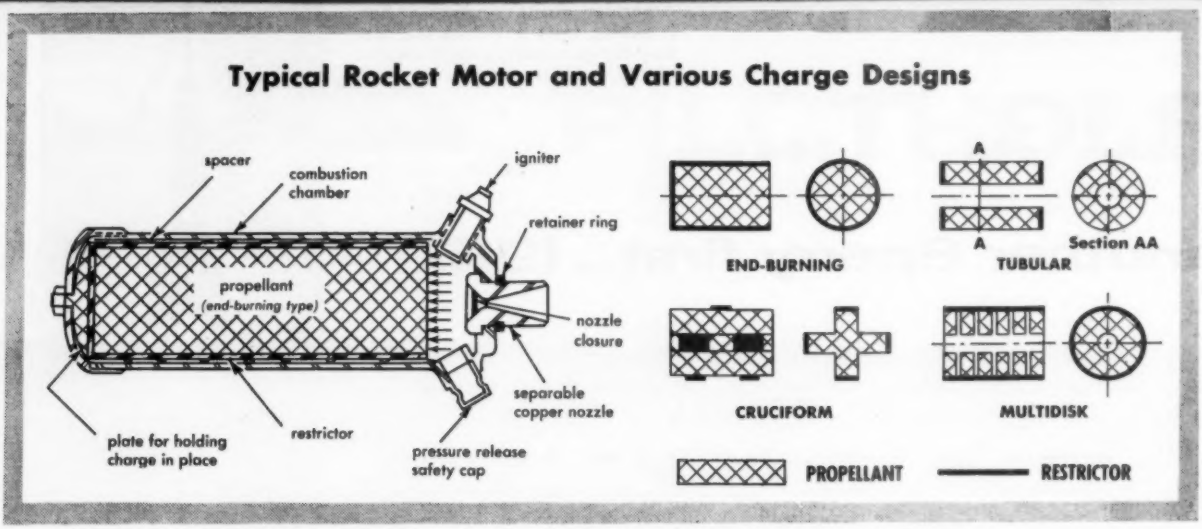


VARYING SHAPES of rocket charges are designed to control rate of burning. "Restrictor" inhibits or prevents burning, lengthening period of thrust.

Advantage Seen in Solid Rocket Propellants

Recent advances in the science promise important developments; solid fuels cheaper, simpler than liquids.

By WALTER A. KILRAIN

DURING the last few years, and particularly during World War II, rocketry advanced from an art to a science with the speed and dramatic impact of one of its own products. Within the last 10 days the General Electric Company announced the development of a rocket motor capable of producing over 20,000 pounds of thrust, safer and more reliable than any previous design. Continuing research in materials and methods promises that such recent developments will be succeeded by weapons and devices that will make them seem as outmoded as Sir William Congreve's first artillery rockets, with which the British armies rocked Copenhagen in 1807.

Today rockets are used to supply an initial boost for some missiles, to provide the propulsive power for other types, to generate gas for a variety of purposes, and to help lift heavily loaded aircraft off the ground. With such JATO units, the take-off run may be reduced 50% if the rocket thrust equals half the static thrust of the airplane's engines. Rocket motors using solid fuel have generated as much as 2000 pounds of thrust for periods up to 30 seconds.

The advantages and limitations in using such solid fuels, as distinguished from liquid ones, are discussed in a paper presented to the American Rocket Society by C. E. Bartley, director of the rocket division at Grand Central Aircraft Company, Glendale, Calif.

Main advantages for the solid propellants, according to Bartley:

- **Ease of shipping** from point of manufacture;
- **Ease of maintenance** in the field;
- **Ease of firing,** by use of simple electrical circuits;
- **Economy of production,** due to simplicity of design;
- **Superior ratio** of total impulse to total weight, in many cases.

These solid propellants, like the liquid ones, do not explode, they burn. How fast they burn depends upon the material in question and the pressure within the combustion chamber (see diagram above), but the rate of burning is expressed as the number of inches per second at which the surface of the fuel recedes in a direction normal to itself. Typical burning rate would be between one and two inches per second at a chamber pressure of 2000 pounds per square inch.

Since the rocket motor's size limits the amount of fuel that can be placed in it, a large thrust (exerted over a short period) can be produced by burning the fuel relatively quickly. By the same token, if thrust is needed for a long time, the fuel's burning must be slower. The speed of burning, as controlled by the amount of burning surface, thus becomes one of the rocketeer's main concerns.

In order to control this speed some propellant charges are coated, on various surfaces, with a lining or coating that inhibits or prevents burning. When the charge is a solid cylinder of which all but one end has been so treated, it is termed a "restricted burning" rocket. Cases where the coating is not used, or used to a lesser degree, are known as "unrestricted." The restricted cylindrical charge is sometimes called an end-burning, or cigarette-burning type.

The various shapes in which charges may be formed are shown in the diagram above, the different configurations and uses of the inhibiting material all being designed to give varying rates of combustion.

Unrestricted burning is generally used where thrust is exerted for periods ranging from 0.05 seconds to 10 seconds. In cases where the thrust is continued from four seconds to two minutes restricted burning is used.

The number of variations adapted for different applications is considerable. Thrust variations and burning times may differ by a factor of 10^3, while the total impulse may vary by factors of 10^4. Despite this wide field, there is one figure that remains almost constant: the total impulse divided by the total loaded weight. This springs from the fact that the energy per unit mass that can be produced by solid chemical fuels is limited. The restriction inherent in this ratio has spurred rocket designers to devote that much more effort toward refining the rest of their device.

When used in JATO units rockets are designed to give uniform thrust during a burning period that may range

How Some Liquid and Solid Propellants Compare
(at 1000 psia)

Propellant	Aniline-RFNA	Ethyl Alcohol-LO_2	Typical Solid Propellant
Specific Impulse (sec)	203	244	200
Density, lb/ft³	86.5	65.5	110
Impulse/unit vol., $\frac{\text{(lb) (sec)}}{\text{(lb)}}$	17,500	16,000	22,000

from five to 60 seconds. The thrust should be fairly uniform, since a sudden large impulse would put an unnecessary strain on the aircraft structure and more particularly on the fittings holding the rocket to the airplane.

Rockets used in these installations become more efficient as the speed of the airplane increases, so the plane should be in motion if possible before the JATO unit is put into operation.

For use on carriers the nature of the exhaust from the rocket is naturally of considerable importance, since thick, toxic smoke would slow down operations on the flight deck and affect the carrier's crew. Burning fragments and corrosive material in the exhaust are also ruled out for the sea-borne rocket.

When the rockets are used to boost a missile into motion, the thrust involved may be considerably greater than that in JATO units, while the toxicity of the smoke is less important.

In the case of guided missiles which use rockets for propulsive power, the burning time may be so long that the combustion chamber itself might overheat if special precautions were not taken. One way of avoiding this possibility is to shape the propellant so that it burns from the center outward, leaving the fuel itself as an insulating blanket against the chamber until the last minute.

The shape of the missile may pose considerable problems for the designer, since the long, thin, cigar-like shape that is favored for aerodynamic reasons presents difficulties from the point of view of heat, pressure, and rate of flow of the products of combustion.

"In general," Bartley observes, "rockets which must deliver a large impulse, say 100,000 pound-seconds, usually must be designed with costs and other economic factors in mind. For this reason, lower performance propellants may be utilized in large booster and assisted take-off rockets in order to reduce costs, even at the expense of lower overall impulse/weight ratios."

Unguided missiles, or artillery rockets, must be designed to meet a wide range of specifications: their speeds may vary between 150 feet per second and 2000 feet per second. In the latter cases the missile is not much more than a flying rocket motor.

Where the rocket is headed now that it has been launched in its new-found status as a more or less exact science is anybody's guess, but research is pushing the state of the art ahead on several fronts. Points of attack:

- **Use of charges** designed to burn internally, keeping the combustion chamber walls relatively cool;
- **Use of propellants** insensitive to temperature changes, a distinct limit in the operational efficiency of current fuels;
- **Use of charges** that are cast, a method which is expected to reduce the cost of manufacture (currently running between $1 and $5 a pound) far below present levels;
- **Use of propellants** with higher energy per unit volume and per unit weight, thus cutting both weight and costs for the motor;
- **Use of construction materials** of high strength, high heat resistance, and low weight for the motor;
- **Use of "gasless" igniters,** with a negligible ignition pressure peak, to provide greater reliability. • • •

Govt. Restrictions Seen Drag on Local Service

A new approach to the problem of stabilizing the local service airline industry has been set forth by Leslie O. Barnes, president of Allegheny Airlines. Barnes cited the need for permanent certification, relaxation of certain restrictions, and a realistic approach to subsidies.

Permanent certificates should be issued after 10 years, he declared; that period of time "should be sufficient to prove public convenience and necessity." Barnes blamed the Government for putting in restrictions "which have made it difficult for the local service carriers to approach self-sufficiency or to prove the 'need' for the service they render." He cited the following restrictions as examples:

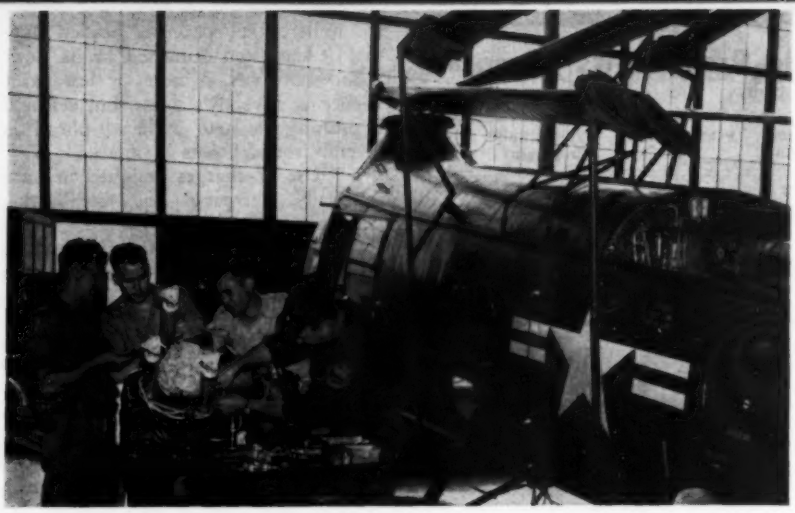
- **Requirement that local service lines** install their own navigation facilities at airports they serve exclusively, under a policy whereby Federal funds cannot be spent for navigational facilities or weather reporting services at airports served only by local carriers;
- **Various operating restrictions** imposed to insure that local airlines will not compete with trunk carriers. "However realistic this may be," Barnes observed, "it nevertheless is both restrictive and costly, and greater freedom of scheduling should be given to the local carriers;"
- **Mail pay structure** which indirectly limits the number of miles local carriers can operate over their certificated routes.

Characteristics of Two Types of

Solid Propellant Rocket Motors

TYPE:	Unrestricted and Semi-restricted Burning.	Restricted Burning.
THRUST:	500 to 50,000 pounds.	100 to 3000 pounds.
DURATION:	0.05 to 10 seconds.	4 to 120 seconds.
IMPULSE:	30 to 100,000 pound-seconds.	1000 to 100,000 pound-seconds.
PROPELLANTS COMMONLY EMPLOYED:	Ballistite (extruded); Cordite (British, Russian, German); NDRC moulded composite*; Thermosetting, cast, composite; British plastic composite.	Cordite; NDRC moulded composite; Asphalt thermoplastic composite; Synthetic rubber thermosetting composite.
APPLICATIONS:	Artillery rockets, armor piercing bombs, anti-aircraft rockets, air to ground rockets, rockets for assisted take-off of light aircraft, glide bombs, suicide aircraft, booster rockets, long range rockets.	Aircraft assisted take-off and superperformance, underwater projectiles, glide bombs, large airborne missiles, booster rockets, gas generation, sounding rockets.
RATIO OF TOTAL IMPULSE TO TOTAL LOADED WEIGHT (EXCLUSIVE OF PAYLOAD):	50 to 150 seconds.	50 to 100 seconds.

** Most of the composite propellants produce a smoky exhaust jet.*



SPARTAN MECHANICS rebuild aft transmission in Army H-25 helicopter during inspection at Fort Sill, Okla., as part of field service contract.

Spartan Takes Over Ft. Sill Maintenance

Three hundred helicopters, fixed-wing aircraft involved; phase-in to be completed by November 1.

By Lois C. Philmus

SPARTAN Aircraft Co. of Tulsa, Okla., is scheduled to assume full maintenance responsibility by Nov. 1 for the approximately 300 aircraft used by the Army aviation school at Fort Sill under terms of what is believed to be one of the largest military-civilian contracts today. It is possible, however, that the changeover can be completed in October.

Spartan began work on the Fort Sill aircraft under terms of an interim phase-in contract on March 26 whereby there was a gradual replacement of military maintenance personnel by civilians, thus relieving military technicians for reassignment to field units.

Balfour

September 1 was set as the approximate date for the completion of the changeover, at which time the cost plus contract would be refigured on an annual basis, at an estimated yearly cost of $1,290,000.

The November extension was necessary because of the trained personnel shortage and complexity of the project. There will be about 300 skilled civilian technicians working on the maintenance project.

Economy dictated the Army's policy in putting its Fort Sill aircraft maintenance in the hands of civilians. Savings in both manpower and dollars are anticipated. Capt. Maxwell W. Balfour, vice president of Spartan, adds: "I believe that one of the principal elements involved in the decision was to obtain a more stable maintenance operation. Naturally, with the turnover, due to men leaving the service, men being assigned to the field, and because of the fact that these men are after all soldiers, it was difficult for the Army to establish a solid core of personnel to maintain a steady operational flow."

The Fort Sill aircraft fleet consists of about 200 fixed-wing aircraft including Beech, de Havilland, and Cessna models. In addition, more than 100 helicopters are used in the training program. The smaller 'copters are Bell H-13's and Hiller H-23's; there are also about a dozen of cargo-size craft in the Sikorsky H-19 and Piasecki H-25 category.

The Army requires that Spartan have a minimum of 80% of the fixed-wing and 50% of the rotary-wing aircraft in operation each day for the student flying program. Minimum monthly flight log is about 74 hours for fixed-wing planes and 50 hours for 'copters.

It is estimated that 1.61 hours of maintenance are required for each flight hour of the fixed-wing aircraft. The utility helicopters require a 4.32 ratio for each flight hour, while 12 hours of maintenance are needed for each airborne hour on the large cargo helicopters.

Maintenance costs are estimated at from $10.75 an hour for the Cessnas to as high as $65 or more for the larger aircraft.

Fort Sill employs the dock system of maintenance which Spartan used at Miami, Okla., during World War II.

Military-civilian cooperation on the contract is shaped to a large extent by methods similar to those employed by the Air Force and the civilian primary flight schools. The Army maintains a quality control group, headed by Major H. M. Luckfield, assistant transportation officer, who is the contracting officer's representative. Working with a staff of seven officers, 20 enlisted men, and 10 civil service employes, he provides continuous observation of Spartan's quality control procedures and property accounting. This group will be reduced after the contractor has assumed full responsibility.

In addition the Army provides all facilities, i.e., buildings, machines and heavy tools. Spartan mechanics furnish their own hand tools, however. Any expansion necessary will be undertaken by the Army. There is a 35,000 square foot hangar currently under construction, which is set for completion sometime this fall and which will house part of the maintenance work.

Capt. Balfour directed the planning of the operation, working with Spartan's Rex Medeira as project engineer and A. L. Charipar, director of maintenance. E. L. Storie served as director of quality engineering and is now the manager.

In line with an anticipated expansion of Fort Sill activities, there will eventually be a fleet of 300 fixed-wing aircraft, about 133 utility helicopters, and 34 cargo 'copters, meaning many more hours of maintenance.

If this materializes Spartan expects to increase its personnel to 400. The greatest shortage of skilled help, according to Capt. Balfour, lies in the field of instrument and radio mechanics, but he plans to bring technicians in from other parts of the country, when the Oklahoma supply is exhausted.

The Army anticipates that by turning its maintenance work over to civilian jurisdiction several problems will be solved. One major problem confronting the Army has been the expense of training mechanics. The majority of the men were in service for 24 months, with their first year spent in training, leaving just one year for them to utilize their skills. The Army was also faced with providing maintenance for planes based at Fort Sill and still having to fill requests for mechanics in field units. Because of personnel turnover the mechanics in many cases had to be retained at Fort Sill, thus depleting the field unit ranks.

In granting the contract to Spartan,

the Army took into consideration that besides the necessity for a stable work force, the Fort Sill installation was an excellent place for maintenance by a civilian fixed base operator, since it is a permanently established installation. The Army feels, however, that such an operation would not be feasible for a field unit which is constantly on the move.

In summing up the new thinking, Balfour says of the Spartan contract with the military: "Contrary to what some people might believe, the Army does achieve a highly efficient utilization of its aircraft. . . . . For that reason, we expect our experience and stability will produce, not only a lowered manpower requirement and dollar cost, but also a stability of availability of aircraft for flying."

When the contract gets on a yearly basis, Spartan expects costs will begin dropping in the second year, since the cost of training personnel will drop after the first year of operation. A drop in personnel is also expected to result in the second year, because of anticipated increased efficiency in the work force based on experience. • • •

Lack of Federal Aid Hits Louisiana Field

Harding Field, Baton Rouge, La., may not be able to last out the winter if some means of financing is not found for two runway and three taxiway projects. An estimated $2 million is needed. The airport, served by Eastern, Delta-C&S, and Southern Airways, was a World War II military field, and, according to an engineering report, the asphalt-paved runways and taxiways are carrying about six times the gross loads they were evaluated for.

George Campbell, director of aviation for Baton Rouge, met with Commerce and CAA officials in Washington recently to discuss the possibility of getting emergency aid. He stated that the field was the first airline stop to feel the lack of Federal-aid-to-airport funds and was pessimistic about the outcome of his meetings with government officials.

The city had been depending on an affirmative reaction to a million dollar bond issue on a recent ballot which was defeated mainly, according to Campbell, because it was included with other bonds for the city which the voters were against. He feels the airport bond issue would pass if reissued by itself assuming no Federal matching funds were available.

The community can get together about $500,000, he stated, but plans must be made quickly for finding the balance.

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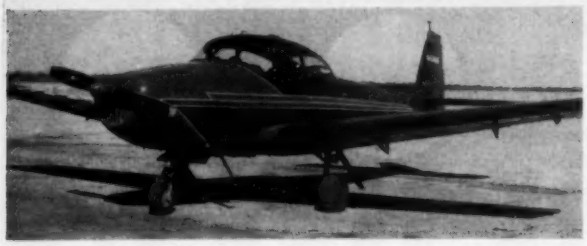


BEFORE conversion sets in, the subject is the standard Ryan Navion single-engine, four-place aircraft for sport and business.

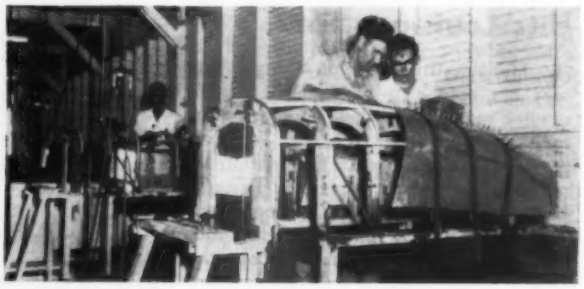
AFTER more than 50 assembly processes the Navion emerges as a new twin-engine configuration, with custom finishing to order.

How Temco Revamps Navions

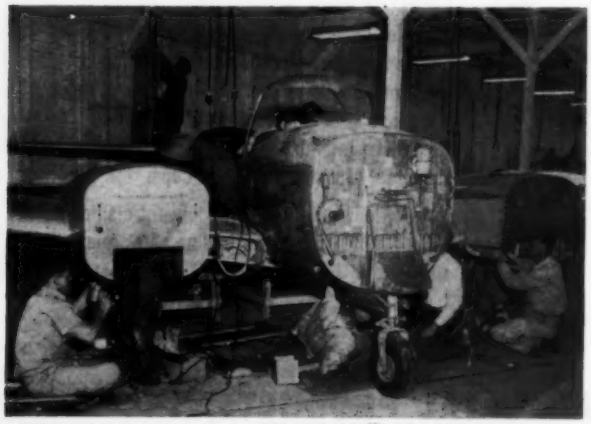
AIRCRAFT CONVERSIONS, the backbone of the executive aircraft market, call for the same techniques used in building a brand new aircraft. Temco Aircraft Corp., turning out Twin Navion Conversions for the Riley Aircraft Sales Corp. of Ft. Lauderdale, Fla., has followed this concept through in its Greenville, Texas, plant. Geared to turn out two conversions a week, the plant houses a 200-foot-long assembly line and a sub-assembly department, as complete in its way as the company's B-47 aft fuselage production line.

All work on the Riley Twin Navion is done on this junior assembly line, with the exception of the initial tear down and paint-stripping of incoming planes. Fifty-two assembly employes are assigned to the project. • • •

FIRST STEP is the strip-down, where the plane is skinned of its empennage, plumbing, nose section, and other stylemarks. Above, the paint is being removed before going to the assembly.



SHAPING OF NEW NACELLES takes place in the sub-assembly section, where this and other detailed parts are prepared for final assembly. Two workers are joining skin and framework.



HALF-WAY MARK is reached in mixture of Navion lines and Twin additions, including new stainless steel firewalls and fin.

ALIGNING JIG insures that nacelles are attached and matched in a precision-plus operation which gives engines 4° down thrust.

West Coast Talk

By Fred S. Hunter

THERE'S been such a volume of talk about lightweight fighters and stripped down fighters, the terms nowadays are frequently used synonymously. They shouldn't be. A lightweight fighter is one where maximum savings in weight are accomplished by miniaturization and similar improvements in engineering design. For example, make a better, smaller, lighter valve by reducing the number of working parts and their size. A stripped-down fighter is made lighter by yanking something off. A parking brake, the motor to open and close the canopy, the supplementary braking system. These, as we recall, were cited as examples of items that could be "stripped" from the F-86 when the superiority fighter controversy first started. Lockheed's XF-104 has been referred to as a "lightweight, stripped-down" fighter. It's a day-superiority fighter and lightweight. Undoubtedly, it will be a very hot airplane. But it won't have any pieces "stripped" off of it.

•

Easiest management decision North American Aviation ever made was decision to call the F-100 the Super Sabre. How could it be called anything else?

•

It's interesting to note how Gilfillan Bros. disperses its manufacturing facilities around Los Angeles. With 2500 employes, it operates at eight locations. Each plant specializes. One is devoted to cabling, one to soldering, and so on. Surprisingly, it requires only 10 trucks for transportation of the work between the different locations. Gilfillan's experience is that it nets more efficient and more economical production by dispersal of its units. Employes can live near by; don't have to drive 20 miles across town, and aren't troubled by parking problem. In smaller working units, the spirit of loyalty is greater. Gilfillan's absentee rate is very low. "And we don't have to go to the government to get the money to build a big hall," adds Dave Callahan. At the height of World War II production, Gilfillan operated 27 plants. It currently is geared to expand quickly into two to four more locations if the need should arise because of a new defense emergency. But barring this it is pretty well set with its eight units.

•

Another interesting development out this way is the "mail order" program Summers Gyroscope Co. got under way last month in offering its high performance Model 69 Gyrovertical at lower fixed prices. Whoever heard of an off-the-shelf item in the field of gyro instrumentation? Heretofore this has been strictly a request-for-quotation business. But now Summers comes out with an announced price tag of $580 per unit for lots of 200 or more and guarantees shipment within 10 days. This is a sharp price cut, too. The reduction is the result of continuing large-scale orders from the Air Force, Navy, and Army, coupled with the development of volume production at Summers' Santa Monica plant. Smaller lots of the Model 69 are available at a slightly higher price. The Summers gyro unit is described as being ideally suited for use as a basic reference element in guided missile and target drone control systems and it also may be used in autopilots for aircraft.

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With so many of its people gainfully employed in the aviation industry, it would seem Los Angeles would have little airport trouble. But the outcries over airport noises and so-called airport hazards are as loud as any place else in the country. Which reminds one of Jimmy Doolittle's observation after his committee's investigation of the airport problem: "We asked people who wanted to move airports where they wanted them moved," he said. "Their only answer was—'Away from here'."

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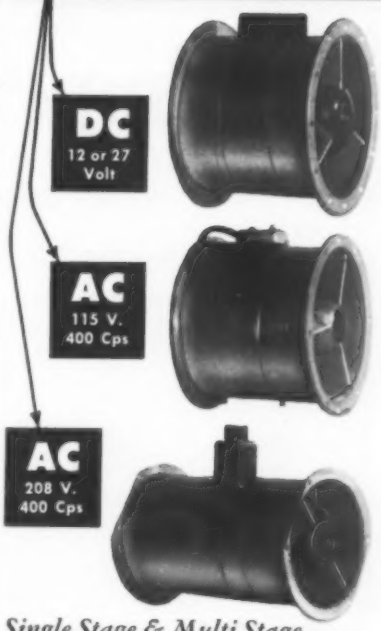

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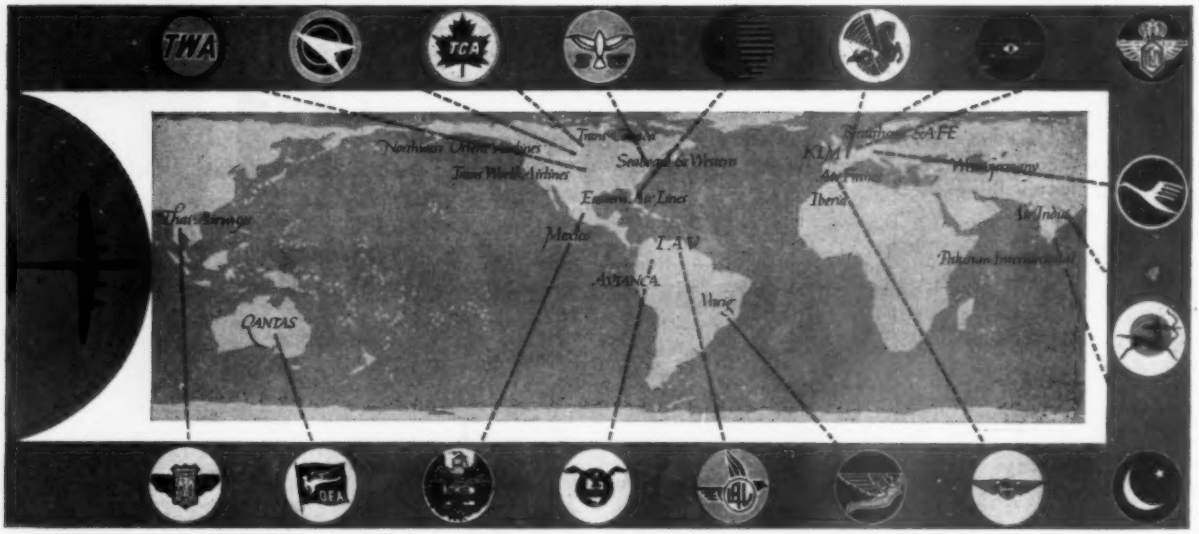

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Super Constellation sales for the first half of 1953 gave Lockheed a midyear backlog of nearly $150,000,000 in commercial aircraft—a new record. As a result, more Super Constellations are on order and more dollar backlog confirmed than for any other commercial transport of this type in the world.

Lockheed's transport production line is now at a higher peak of activity than at any time in Constellation history, and on the basis of hard cash on the counter the Super Constellation has proved itself the most popular single transport in the world today.

All Orders Are on Schedule

Lockheed production this year will approximate $765,000,000 in commercial and military planes—topping the record for the entire industry for any prewar year. In spite of this tremendous output of 12 different types of aircraft, every single production order is on schedule both in California and at the Marietta, Georgia, plant.

Lockheed News Briefs

A newly formed group of Lockheed engineering scientists will devote full time to the study of aviation trends 10 to 25 years from now.

The Navy's big Lockheed P2V patrol plane will now have a tremendous extra burst of speed for quick getaway in enemy waters. When used for anti-submarine warfare, 2 jet engines will be slung under the wings in quick-detachable pods, giving added thrust to its twin turbo-compound engines. Now experimental, but being considered for wide-scale use on the versatile P2V Neptune.

Military interest is high in the recent operations of turbo-compound Super Constellations as early-warning picket planes for the U. S. Air Force as well as the Navy. U.S.A.F. designation is RC-121C, Navy is WV-2. Each carries 6 tons of latest electronics equipment, accommodates a crew of 31. Gives the U. S. high-flying radar stations that will extend our warning system far beyond the horizon limits of surface radar.

A new Lockheed-developed leak-proof fuel-line coupling is now being installed in Lockheed jet aircraft. Provides greater safety against leakage, is only 20% the weight of former types.

Lockheed engineers have produced a new automatic ejection seat making possible a more fully guided catapult stroke and saving space by compacting the seat and its accessory equipment.

Lockheed has produced and delivered its 25,000th airplane.

Extra Section

By Preble Staver

IT HAS BEEN a scant 15 years since the Democratic-controlled 75th Congress passed the Civil Aeronautics Act of 1938. Although this is a brief span of time as laws go, the Act has remained virtually unchanged. This can be taken as a sign it has been a successful law and is accomplishing its purpose. As the basic law for commercial aviation, it has succeeded immeasurably. First, the Act was successful in its design to bring order and stability out of the chaotic conditions existing in the air transport industry in 1938. Second, it has continued to provide the guide-post and rule which makes the United States the world leader in commercial civilian air transportation that it is today.

•

But what about the men in Congress who were responsible for the enactment of it? A quick recount finds that the 1938 Act has out-lasted most of those who were present when it was originated. In the 75th Congress there was a total of 531 members—98 Senators and 433 Representatives—when the Act was put through. Today, 15 years later, there are only eight members of the Senate and 58 in the House who were then in service. The stand-out among these 63 Congressmen who have remained on the Washington scene is able and aviation-conscious Sen. Pat McCarran (D., Nev.). Credited with being the father of the Act, the Nevada Democrat has authored numerous aviation bills in the Senate over the years. For many years he served on the Senate Commerce Committee, the group which handles all legislation on civil aviation.

•

As the Senate Commerce Committee is presently constituted, there is but one senator who is a member and was also in the Senate in 1938. He is **Sen. Edwin C. Johnson** (D., Colo.), former committee chairman and now ranking minority member. Senator Johnson, in the intervening years, has become the leader in Senate aviation affairs. Over on the House side, **Rep. Charles A. Wolverton** (R., N.J.), chairman of the Commerce Committee, and **Rep. Robert Crosser** (D., Ohio), former committee chairman, are the only two current members of the group who were there when the Act was passed.

•

The 83d Congress was in session for exactly seven months this year, from January 3 to August 3, during which time a total of 288 public bills became law. Out of this total, 16 public bills were enacted into law which related directly to commercial aviation. The latter are, however, mostly on such aviation matters as are affected by the customary appropriations acts. This coincides with complaints of a "do-nothing" Congress and the record of the first session of the 83d Congress does show very little affirmative action on measures having a bearing on commercial aviation.

•

A resume of the 1953 legislative activity gives a total of 10,965 measures introduced, which included 180 on aviation. A breakdown of the overall total was 2931 measures introduced in the Senate, 7764 in the House. Of those presented in the Senate there were 969 measures reported, of which 848 were passed. In the House, 1094 measures were reported, with 1048 achieving passage. The record on the 180 strictly aviation bills showed that 136 were introduced in the House and 44 in the Senate. When Congress adjourned, just five of the aviation bills had reached the halfway mark in the legislative mill. Two of the bills were left pending in the House; the Senate had the other three. The balance are still in committee.

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Board Overrules PO on West Coast Mail Pay

CAB has overruled Post Office objections to final mail rates proposed for West Coast Airlines, which means the local service line will get $1,614,528 of annual mail pay, retroactive to August 1, 1952. That was the date West Coast took over Empire Air Lines under a CAB-approved merger.

The PO had objected to CAB's recognition of a higher value for the five DC-3's obtained in the deal by WCA than the $96,432 net book value of the equipment to Empire. CAB recognized a figure of $181,724, or the purchase price paid by WCA, minus the full depreciation allowed to Empire as of the closing date of the merger agreement.

CAB Chairman Oswald Ryan cast a dissenting vote upholding the position of the PO.

The Board majority, however, held to be "without merit" a PO argument that CAB was "improperly offering" WCA an incentive in the form of a bonus for voluntary transfer of routes contrary to principles embodied in a recent Court of Appeals decision on offset issues in the Western Air Lines case.

Insofar as the court decision is concerned, CAB said, "it should be noted that the mandate of the Court has been stayed pending the filing of petitions for certiorari to the Supreme Court. Until that proceeding is finally determined, we feel impelled to abide by our position in that case which we still believe to be sound."

Chicago Keeps Lead in Air Carrier Traffic

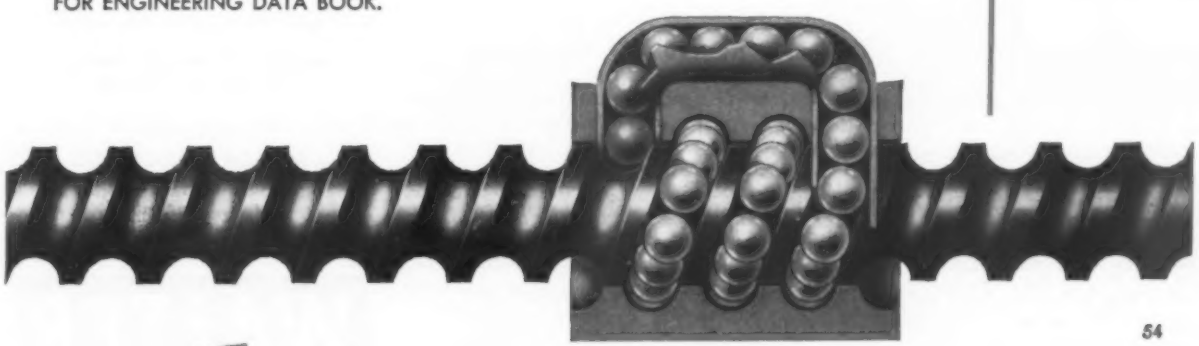
CAA control towers recorded 2,598,741 air carrier movements for the first six months of 1953 at U. S. civil airports, out of a total of 8,159,011 civil and military plane movements. Chicago's Midway Airport again led the top 25 airports in air carrier movements for the period, with a total of 124,620, or 82% of its total. LaGuardia Field, N. Y., and Washington National Airport took number two and three spots, with air carrier totals of, respectively, 88,993, or 85% of total, and 79,782, or 83% of total.

The rest of the 25, in order, are as follows: Los Angeles, Miami International, San Francisco, Detroit's Willow Run, Dallas' Love Field, Cleveland, N. Y. International, Greater Pittsburgh, Atlanta, Boston, Philadelphia, Oakland, Kansas City, St. Louis, Newark, Burbank, Jacksonville, Indianapolis, Louisville, Minneapolis, Greater Cincinnati, and Denver.

SAGINAW BALL BEARING SCREWS PROVE THEIR EFFICIENCY IN THE BANSHEE

Nine of the electro-mechanical actuators on the McDonnell Banshee F2H-2 use Saginaw Recirculating ball-bearing screw and nut mechanisms. Installations include wing fold, main landing gear, landing gear doors, speed brakes and nose landing gear. Saginaw screws with rotary-to-linear force transmitted through rolling steel balls operate at more than 90% efficiency. This means that the torque —the rotary power equipment—is only a small fraction of that required for a thread-to-thread screw, thus resulting in important weight savings. Saginaw screws are efficient, accurate, reliable, compact, and low in weight-strength ratio. They can be effectively combined with electrical, hydraulic or pneumatic units and can be furnished for actuator applications in any size in a complete range of load and life requirements.

FOR MORE COMPLETE INFORMATION, WRITE FOR ENGINEERING DATA BOOK.

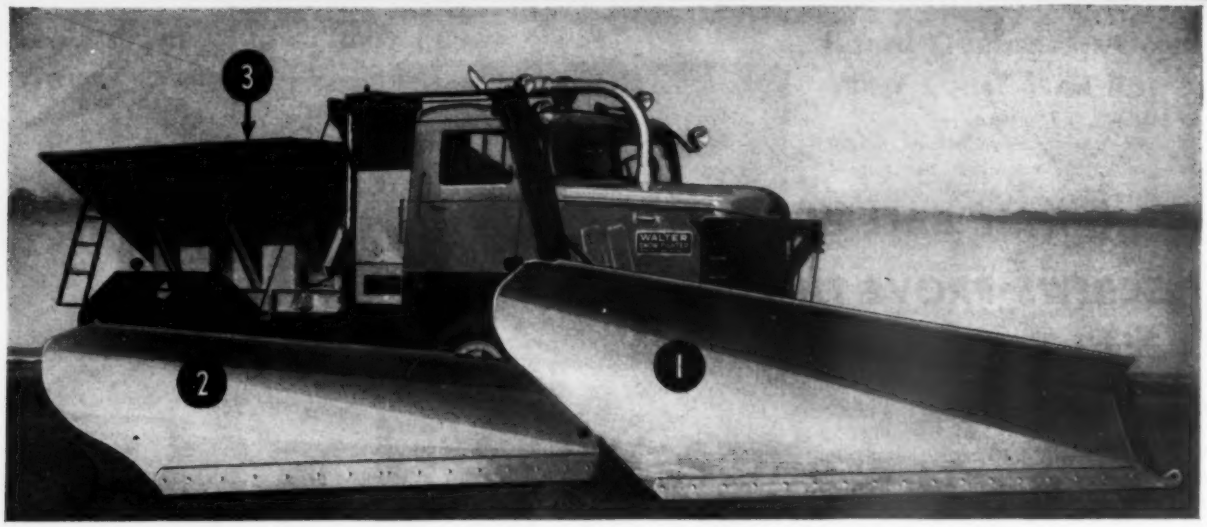


54

Saginaw STEERING GEAR

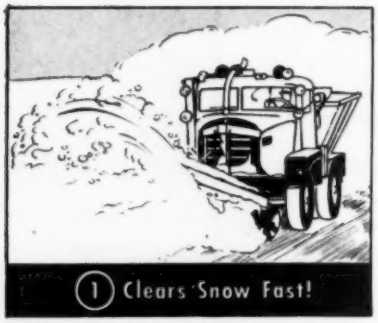
DIVISION, GENERAL MOTORS CORPORATION, SAGINAW, MICHIGAN

MANUFACTURER OF SAGINAW POWER STEERING FOR PASSENGER CARS, TRUCKS AND TRACTORS



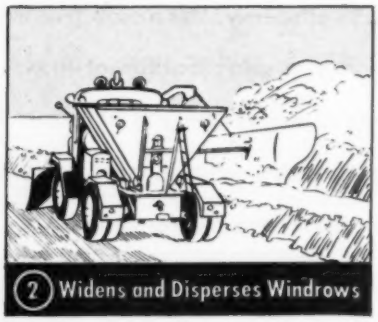
Snow and Ice Problems Solved

by this versatile "3-IN-1" COMBINATION WALTER SNOW FIGHTER



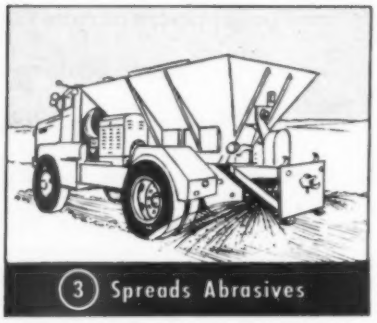
① Clears Snow Fast!

Combination of one-way plow and speed wing clears 16 foot width, at speeds up to 35 m.p.h. Plow is designed with high-lift moldboard to pour snow far to the side, leaving less to re-handle. Exclusive obstacle-jumping linkage absorbs shocks, permits clearing down to pavement with safety.



② Widens and Disperses Windrows

Hydraulically controlled 12-foot side wing widens, cuts down and disperses windrows at high speed, fanning out snow to remarkable distances to prevent build-up of high snowbanks. Great power and traction provide sustained high-speed operation on successive widening runs.



③ Spreads Abrasives

Dangerous icy runways are made safe for landings and takeoffs in 20 to 30 minutes, by means of the 10-ton capacity automatic spreader. It spreads abrasives or chemicals at high speed, to any desired width. Controlled by one man in the cab, eliminating slow, costly hand methods.

Great power — traction — speed to handle ALL conditions

No matter what winter hazard threatens your airport—snowstorms, blizzards, sleet storms, icy runways—you have the fastest, most effective answer in this scientifically equipped combination Walter Snow Fighter.

With its clearing speed up to 35 m.p.h. and its high-volume displacement, you can clear a 150 foot width on a mile-long runway in 20 minutes—the entire runway in 1 to 1½ hours—in average snowstorms.

Only big, powerful, high traction Walter Snow Fighters can mount and effectively use such high-capacity equipment. This 42,000 lb. g.v.w. unit is powered by a 240 h.p. engine—has the non-slip traction of Four Point Positive Drive—is specially constructed in every detail for the punishing work of snow removal.

Don't delay getting full details on this "3-in-1" Combination Walter Snow Fighter. There is still time to benefit from its protection, if you act now.

• Ask your Walter distributor for complete details — or write us for literature.

WALTER
MOTOR TRUCK CO.
1001-19 Irving Ave.,
Ridgewood 27, Queens,
L. I., N. Y.

WALTER
4-POINT POSITIVE DRIVE
SNOW FIGHTERS

Maintenance Bulletin Board

Sched-U-Graph Controls UAL Workload

The United Air Lines system of progressive aircraft overhaul, a plan which permits the airline to maintain an orderly flow of some 22 aircraft of five different types through its San Francisco base each month, is recognized as one of the finest in the industry. One of the major factors that has spelled success for UAL in its overhaul program has been the ability to find a satisfactory method of controlling shop workload. It involves:

• **Job assignments** for the 2500 mechanics and technicians employed at the base, planned in advance of aircraft arrival.

• **Loading of work areas** at each of the six overhaul docks, to ensure that too many mechanics are not assigned to work in the same area at the same time.

The problem was solved by United with the adoption of the Remington Rand Sched-U-Graph, which has become the key to the UAL progressive overhaul system. According to Harold L. (Hal) North, United's chief overhaul planner, the charting device now permits job assignments to be given out in three minutes, instead of half an hour, as in the past.

The principle of the United system is that each job to be done on an airplane during the five-day shop visit is printed on a separate, numbered work card. A full twenty-four hours before a Douglas DC-6 arrives at the base, the overhaul planning section "loads" the Sched-U-Graph, assigning job cards to individual mechanics by name.

The chart board has a plastic pocket running horizontally across it, and the worker's names are listed in each visible pocket along the board's left side according to their specialized field, sheet metal, hydraulics, etc. Capacity of the Sched-U-Graph permits loading space for the day and swing shift on each board, and UAL pre-planners load five boards in advance for each DC-6 entering the base.

Actual operation of the Sched-U-Graph is handled by a dock planner stationed immediately adjacent to the airplane in work. At the beginning of a work shift, as each mechanic reports for duty, the dock planner tears his first work card from the board, leaving a stub in the transparent pocket of the Sched-U-Graph.

Before release to the mechanic the job card is time-stamped "out," and after the job is done, the card is stamped "in" when returned by the mechanic to the planner. During a given eight-hour tour each mechanic is scheduled for about six hours of work. The two extra hours are left unassigned to provide manpower for the 33% to 45% "unforeseen" maintenance which, according to United's experience, usually crops up following initial inspection of the airplane.

Under the United progressive overhaul plan, the complete overhaul for a DC-6 is spread over 24 visits to the base and the workload for each visit is preplanned so that approximately the same number of man-hours will be required for each visit. This workload is in turn planned on the Sched-U-Graph for each of the five days that the airplane will be in the dock.

To United the production experience of World War II obsoleted the old charting methods involving squared paper, complicated punch boards, crayons, pins, and pegs. The need for speed not only made scheduling imperative, but it became evident that progress toward job completion could best be expressed in graph form, hence its selection of the Sched-U-Graph.

Now any job, whether performed by one mechanic or a group of mechanics, can be scheduled and loaded on the Sched-U-Graph, North explains. The only requirement is that the time that it takes to do the job be estimated in advance with reasonable accuracy.

Northwest Rewires Stratocruiser Wings

Northwest Orient Airlines has undertaken a major rewiring program on its fleet of 10 Boeing 377 Stratocruisers. The program will cost the airline about 4000 man-hours in labor and $35,000 in total modification expense, but is expected to provide a B-377 wiring installation that will last indefinitely.

The Northwest project calls for replacement of all wing section wiring from the electrical plant to engine com-

ponents, navigation lights, and landing lights. Instead of routing the wiring along the wing rear spar, as in the original Boeing Airplane Co. layout, NWA installation calls for routing in a more protected area along the forward side of the wing front spar.

Experience at Northwest which led to the change has shown that rear spar wiring on the five-year-old Boeings has suffered needless wear from exposure to dirt, oil, and cleaning fluid. Reason is that rear spar is located directly over and in front of the wing flaps and is constantly exposed to the elements.

Cooling Problem for Beacons on Ground

Early experience with the use of the Grimes fin-mounted rotating aircraft beacons, now meeting with wide acceptance among the airlines in the U.S., points to the need for precaution against their prolonged operation on the ground. Despite the fact that most light circuits on airline transports are arranged so that they will be de-energized during ground operation, mechanics often by-pass this circuitry in simulating "in-flight" conditions for checking various aircraft systems.

The particular type of difficulty that has appeared stems from the high heat generation of the 50,000-candlepower sealed beam used in the beacons. Without the benefit of flight cooling the life of the sealed beam is shortened and the plastic dome has been found distorted to the extent that the rotating feature of the beacon can be disabled.

Putting the
"FEEL"
back in the
WHEEL
Now the F-84F Thunderstreak "talks back to" the pilot . . . actually gives him the feeling of Flight Control through the wheel in his hands. All this is possible with the assistance of the Aileron Box Assembly.
Considered as a production item, the Aileron Box Assembly requires light weight nonferrous castings, machining, the purchasing and inspection of other components and finally the assembling into a finished unit, to specifications, ready for installation on the airframe. Complete facilities permit South Gate to assume full responsibility. South Gate invites correspondence concerning your companies requirements: we are equipped to handle your Aluminum or Magnesium castings or complete sub-assembly.
Engineering design services available — mechanized foundry — complete machine facility—Zyglo and X-ray inspecting—systematic production control.
New York—Bank of Manhattan Bldg.—29-27 Bridge Plaza—Long Island City 1, New York
Tulsa—Bob Ward Bldg., Rm. 202—1341 So. Boston—Tulsa, Oklahoma
South Gate Aluminum & Magnesium Co.
The only mechanized light metal foundry West of Chicago
5331 Tweedy Boulevard — South Gate, California — LOrain 6-5161

Window Modification Cuts Noise by 25%

A $125 cabin modification for executive Beech D18S airplanes which involves the simple addition of another set of Plexiglas windows is cutting the interior noise level in the order of 25%, according to the Airtex Corp. of Spartanburg, S.C. Airtex developed the design and has made the installation in a number of corporate aircraft.

Cost of the extra windows alone is said to be $100 f.o.b. Atlanta, Ga., or Spartanburg, and the installation charge by Airtex is $25. Key to the design is simplicity—it requires no alterations, no screws, and no special clamps.

No Slippage Marks

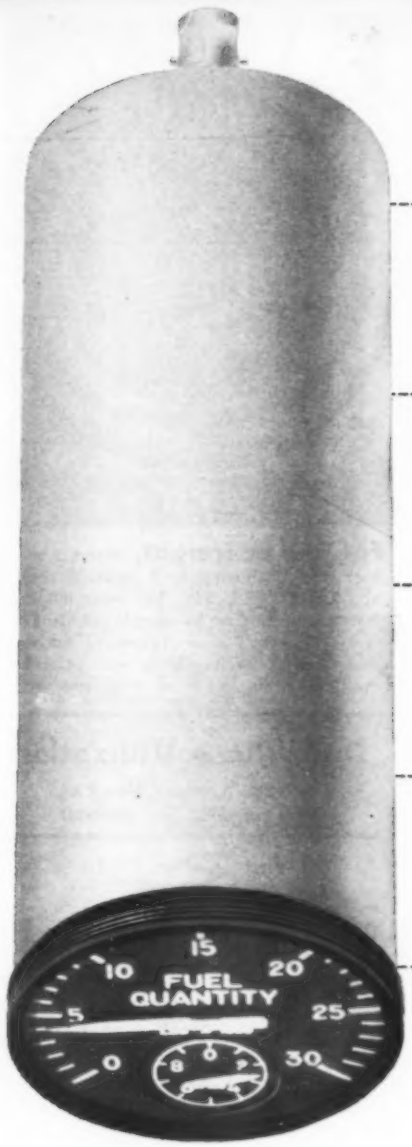
The long standing practice of painting slippage marks on torqued aircraft bolt and nut installations has been discarded by one major airline. The reason —no instance has ever been reported where a nut or bolt slippage mark was ever found to be misaligned.

The operator plans to continue periodic checking of bolt and nut torque as in the past, but wherever the slip marks are found they are being removed.

Books

PILOT AND AIR-CREW HANDBOOK. *Published by T. J. Bodwell, Dept. 55, 5864 Hollywood Blvd., Hollywood 28, Calif. 72 pages. Price $2.50.*

This pocket-sized, spiral book serves as ready reference on CAR's, GCA locations, radio information, ADIZ locations, weather map symbols and descriptions, wind force tables, and temperature conversion data. A pilot log section is included. LCP



1 IT COSTS LESS. This "repackaging" of Avien's fuel gaging system brings the purchase price to a new low. The system is reduced to a sensing unit and an indicating unit, eliminating the bulky and expensive intermediary unit.

2 IT'S 50% LIGHTER. Lightness always brings cost savings. Avien's Two-Unit Fuel Gage incorporates the bridge and amplifier functions into the indicator case. Less wiring and connectors are needed.

3 IT NEEDS NO FIELD ADJUSTING. With the elimination of the intermediate unit, which had to be supplied as a common part, *all* Avien units are pre-calibrated for the aircraft they are designed for.

4 IT TAKES LESS TIME TO INSTALL. The Two-Unit Gage is remarkably easy to install. No specially-trained personnel are needed. No specialized test equipment is needed. No calibration instruction or data is needed.

5 IT'S EASIER TO MAINTAIN. With fewer components in the system, less maintenance is required. Trouble-shooting becomes easier. And fewer parts must be stocked for replacement and repair.

6 IT CAN BE INTEGRATED WITH FUEL MANAGEMENT. Simulators, level switches, balancing controls, etc., can be hooked up to the Two-Unit basic system with less expense and less trouble than ever before.

6 definite ways you can cut costs with Avien's "TWO-UNIT" FUEL GAGE

Avien's Two-Unit Fuel Gage is creating a lot of talk with manufacturers, engineers, and purchasing men.

This new "package" means that Avien units are now all "shelf items." As long as the units are designed for the same aircraft, they're completely interchangeable.

The Avien Two-Unit Fuel Gage is now scheduled for production, to meet your manufacturing programs. The indicator is available in either large or small sizes, with all varieties of dial configurations.

Every month, Avien produces over ten thousand major instrument components for the aviation industry.

We believe the Two-Unit Gage is so important that your inquiry should not be delayed another day. Write or call us.

Avien

AVIATION ENGINEERING DIVISION

AVIEN-KNICKERBOCKER, INC.

58-15 NORTHERN BOULEVARD, WOODSIDE, L. I., N. Y.

No matter how marginal the weather, planes land safely on fields equipped with TVOR. This new let-down facility keeps your airport operating through rain, low ceilings and restrictions to visibility—extends its usefulness by 40%. TVOR provides all the security of VOR—*at less than one-fourth the cost.*

TVOR was developed to meet the needs of small and medium-sized airports. Its single installation provides a terminal omnidirectional radio range that can be installed in an inexpensive shelter directly on the airport.

Any plane with standard VOR instrumentation can make *positive approaches* to a TVOR equipped field. On course indication is steady. Over the station cone is definite. Fifty watts of antenna power provides ample coverage for omnirange navigation. TVOR is built by the Maryland Electronic Manufacturing Corporation, producers of similar installations for the CAA.

The cost of a complete TVOR installation is less than a quarter that of VOR. Yet the components are of the same high quality and the system is given the same rugged tests!

Corporation, municipal and private airfields can't afford to be without the safety and convenience of this all-weather let-down facility. Installations are ready for 90 day delivery. Write or call today for further information. Or flight test and inspect the equipment at the College Park Airfield.

TVOR changes fair-weather to all weather airline service.

TVOR guides corporation aircraft safely to their home fields, in spite of low ceilings.

TVOR works with standard instrumentation. Private planes "home" on their own airfield.

MARYLAND ELECTRONIC MANUFACTURING CORPORATION
COLLEGE PARK 26, MARYLAND

For fuel or freight, external wing fuel tank of Boeing B-47 Stratojet shown at MacDill AFB, Fla., has been modified into cargo carrier by simple addition of two side access doors, plywood flooring, and tie-down bolts. Tank was originally built for Boeing by Ryan Aeronautical Co.

Daily Plane Utilization

Average Revenue Hours of Use Per Day Per Aircraft

First Quarter, 1953

Domestic Trunks

American	2 eng. pass.	6.41
	4 eng. pass.	9:55
	cargo	4:06
Braniff	2 eng. pass.	6:30
	4 eng. pass.	8:19
	cargo	4:45
Capital	2 eng. pass.	6:29
	4 eng. pass.	8:26
	cargo	8:48
Caribair	2 eng. pass.	5:10
	cargo	2:04
C & S	2 eng. pass.	9:10
	4 eng. pass.	9:23
Colonial	2 eng. pass.	6:07
	4 eng. pass.	8:57
Continental	2 eng. pass.	6:38
	4 eng. pass.	5:29
Delta	2 eng. pass.	7:48
	4 eng. pass.	8:55
	cargo	6:34
Eastern	2 eng. pass.	6:38
	4 eng. pass.	11:33
Hawaiian	2 eng. pass.	5:27
	cargo	3:23
National	2 eng. pass.	7:58
	4 eng. pass.	8:58
	cargo	5:41
Northeast	2 eng. pass.	5:53
	cargo	6:00
Northwest	2 eng. pass.	8:01
	4 eng. pass.	8:50
	cargo	6:00
Trans Pacific	2 eng. pass.	5:33
TWA	2 eng. pass.	4:58
	4 eng. pass.	7:31
	cargo	5:10
United	2 eng. pass.	4:43
	4 eng. pass.	8:20
	cargo	5:10
Western	2 eng. pass.	6:37
	4 eng. pass.	7:46

Precision grinding of hydraulic sleeves to a tolerance of .0002

Craftsmanship COUNTS AT CANADAIR...

No finer testimonial to Canadair's craftsmanship could be found than the proved performance of the planes she has built.

Craftsmanship will always count at Canadair because Canadair is centrally located in one of Canada's largest reservoirs of skilled craftsmen... men raised with an inherent appreciation of fine work... men who take personal pride in their skills.

This great team of Canadair craftsmen is geared to meet any assignment in the production of aircraft: either military or civil... confident in the established record of building lasting quality into the planes they produce.

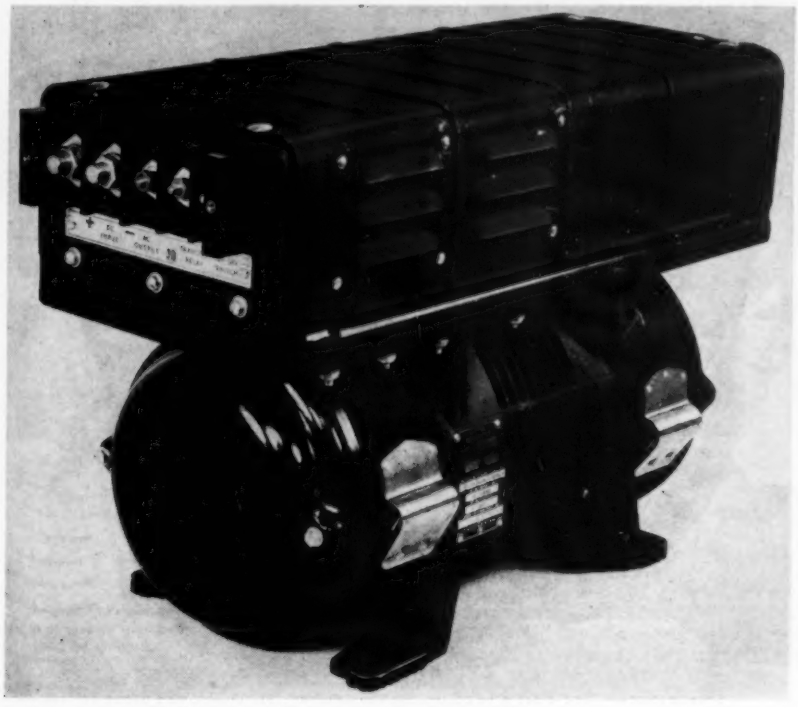
CANADAIR

LIMITED, MONTREAL, CANADA

A subsidiary of
GENERAL DYNAMICS CORPORATION
New York, N.Y. — Washington, D.C.

CAS3-15UBT

New Products



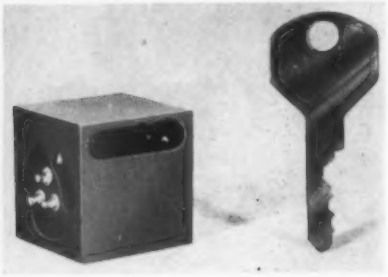
Airborne Inverter in 1500 va Class

Now undergoing flight tests, the model F137 airborne inverter is the first in the 1500 volt-ampere class to have completed U. S. Air Force 50,000-foot altitude cycling tests and received a military production release, according to its manufacturer, Jack & Heintz, Inc. The company is also planning production of a 2500 va/50,000 foot inverter, the model F147, and is designing an environmental free 2500 va inverter for operation at even higher altitudes under an Air Force development contract.

The model F137, which is used to convert direct to alternating current for the operation of instruments, controls and accessories, produces 115-volt, 400-cycle, single-phase, a-c current. A modified version of the standard Jack & Heintz rotary inverter, it includes improved electrical insulation, redesigned commutators and brush arrangements, and a new housing design for better airflow, all engineering changes to combat high altitude overheating, insulation breakdown, and excessive brush wear.

The F137 also uses a new speed and voltage regulator assembly, a unit which combines functions formerly handled by a separate speed governor and voltage regulator. Although intended for the F137 inverter, this regulator is adaptable to any earlier J&H 1500 or 2500 va inverters.

Address: **Jack & Heintz, Inc.,** Cleveland, O.

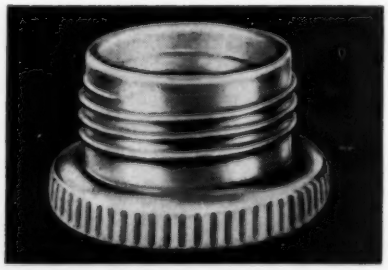


Blower. A subminiature blower for cooling electronic equipment weighs only one ounce and measures one cubic inch dimensionally, according to its producer, Sanders Associates, Inc. With an output of three cubic feet of air per minute, the new Minicube blower, as it is called, can be mounted next to a component for spot cooling, or, in the case of hermatically sealed equipment, for heat transfer to or from the case.

Mounted internally in sealed equipment, the blower can be used to transfer heat to the case, or mounted outside, to remove heat from the case. Using the Minicube, the rating of such electronic components as power resistors can be increased by properly attaching a blower directly to the component, the manufacturer claims.

The blower is powered by a synchronous motor turning at 24,000 rpm which can be supplied for either 6.3 volt—3 watt, 26 volt—4 watt, or 400 cycle operation. The motor is normally two phase, but can be operated from a three-phase or single-phase source by using a phase shifting capacitor.

Address: **Sanders Associates, Inc.,** Nashua, N. H.



Sealing Cap. A metal cap for the protection of aircraft hydraulic units, fittings and lines, designed specifically for the Weatherhead Company's Ermetto type fittings, is being marketed by Tubing Seal Cap, Inc.

Called E R A closures and available in sizes from three through 24, the new metal caps can be spun on by hand, requiring no tools. They protect threads, seal out dust and moisture, or seal in fluid when required, during manufacture, shipment and storage.

Address: **Tubing Seal Cap, Inc.,** 808 W. Santa Anita, San Gabriel, Calif.

Pump. This new Vickers, Inc., model PV-3918 variable displacement hydraulic pump which will first see service on airline Douglas DC-7 cabin pressurization compressors is a 3000 psi pump rated to deliver 2.349 cubic inches of oil per revo-

lution. On the DC-7 the new pump will

No longer being worn

There's always a field trip you *should* take, some work you *should* do away from the home office.

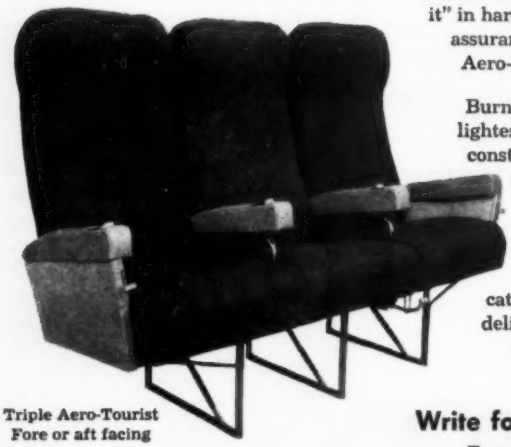
But ordinary travel methods don't allow you the *time* you need. That kind of ball-and-chain confinement is no longer faced when company-owned Beechcrafts serve you.

Thousands of up-and-coming business men use their Beechcrafts *profitably* . . . every day. Travel-time is cut as much as 75 per cent. You go at *your* convenience, keep mobile, "see for yourself." And these benefits are more important than ever today. Typical costs and operating data on request. *Call your Beechcraft distributor or write Beech Aircraft Corporation, Wichita, Kansas, U.S.A.*

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

BURNS AERO–Tourist Seats

Sturdy, handsome...and comfortable!



Triple Aero-Tourist
Fore or aft facing

Passenger comfort and eye appeal...easy installation and the ability to "take it" in hard Air Tourist service—your assurance when you install Burns Aero-Tourist seating equipment!

Burns Aero seats are among the lightest ever designed • CM steel construction keeps maintenance at a minimum • Contoured and cushioned for greatest comfort • Superb craftsmanship • Built to individual airline specifications • Prompt, *on-schedule* delivery • Burns Aero-Tourist seats are in airline service throughout the world.

Write for details—Airline or Executive aircraft seats.

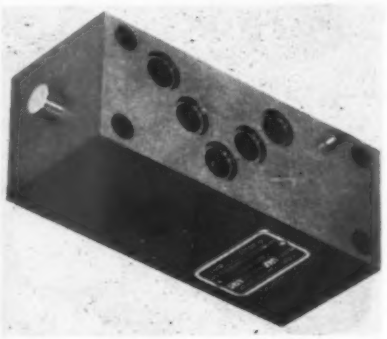
BURNS AERO SEAT CO., INC.

3900 COHASSET STREET, P. O. BOX 127 • BURBANK, CALIFORNIA

lution. On the DC-7 the new pump will produce 147% greater oil flow capacity than the type used in the DC-6 compressor installation, with only a 50% increase in weight.

One special feature of the PV-3918 pump is an overspeed control which automatically limits the maximum pump output and thereby acts as another safety check on compressor impeller speed.

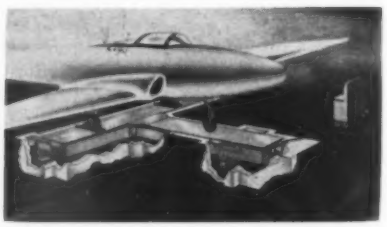
Address: **Vickers, Inc.,** 1400 Oakman Blvd., Detroit 32, Mich.



Control Valve. A mechanically operated, high-pressure hydraulic control valve for follow-up, booster-type positioning systems has been placed on the market by the Hydraulic Controls Co. Available in a variety of horsepower and flow ranges for system pressures up to 3000 psi, the model CO valves, as they are designated, are available for either manifold mounting or threaded for pipe or AN tubing fittings.

For those installations where small forces are available for valve actuation, valves may be procured in which normal stroking forces are considerably reduced so that only light spring force is required to maintain the valve piston in contact with the driving cam.

Address: **Hydraulic Controls Co.,** 87 Terrace St., Roxbury 29, Mass.



For direct measurement of jet aircraft thrust, new thrust stand shown here in artist's conception is development of Bristol Engineering Corp. of Bristol, Pa. Accommodating aircraft with total thrust output of 50,000 pounds. Bristol stand is said to be accurate within ½ of one per cent. Design uses a closed circuit hydraulic measuring system. Standard model with instrumentation sells for less than $10,000.

Airline Commentary

By Eric Bramley

WITH the big expansion in domestic scheduled coach flights, we think airlines should give serious thought to how they're going to maintain some semblance of passenger service in connection with such trips. This isn't going to be easy when you're checking in 70-80 people and carrying them all on one plane.

After two recent experiences, we believe improvement is needed. Check-in procedures are in bad need of streamlining—those long lines at counters are getting longer. Agents are hurried and harried, which has a bad psychological effect on passengers. We also wish someone would find a more orderly way of boarding, instead of allowing 80 people to rush out the gate. Stewardesses, incidentally, were excellent and made up considerably for the waits and confusion on the ground.

It may be argued that this is coach, that you get no attention on rail coach, so why bother. But airlines have built themselves on passenger service. Old-time riders tell new customers about the fine treatment, and the latter come to expect it, be it on first-class or coach. So, in our opinion, some degree of service is a must.

•

Mohawk Airlines recently completed an interesting series of interviews, discovered some significant things about its service, and did something about it. Instead of distributing questionnaires broadside to passengers, Mohawk concentrated on 75 people who use the airline as their primary source of business travel. Helen Thomas, assistant to the general manager, called on all 75 and spent considerable time questioning them.

Many aspects of Mohawk's service were satisfactory. But when she asked about aircraft interiors, she hit bottom. Nobody thought interiors were excellent or good; they classed them as fair or poor. And Miss Thomas found a great need for making more accurate information available via phone and over the counter.

The survey was a major factor in Mohawk's decision to refurbish its DC-3 fleet. It's installing new seats, reducing noise level, tripling the size of carry-on baggage space, putting in mahogany panelled bulkheads separating cabin from entrance, installing fans, etc. Also, a new training program has been set up for agents and sales reps, and the customer service manager is working actual shifts in various stations to give more complete on-the-job training.

•

The British magazine *Aeronautics,* edited by outspoken **Oliver Stewart,** in commenting on some of this column's statements concerning sales promotion, adds some thoughts that may interest sales and traffic men. "I have not yet noticed any airline adverisement of the fact that, for old people and invalids as well as young children, flying is the only method of unaccompanied travel which can be undertaken with confidence," the writer says, adding that "due to the proficiency of medical science in keeping people just alive, old people and invalids form an increasingly large section of the public. The airlines could help them more than they do as yet, and they represent a big potential source of revenue, for many of them have money to spend and a great desire not to be imprisoned by infirmity."

•

ODDS AND ENDS: Capital Airlines is **first airline on Dave Garroway's** morning TV show, "Today." Commercials are very effective . . . Braniff Airways recently held a **"sales clinic" just for its 200 hostesses**—an excellent idea . . . Railroads are said to be considering **payment of commissions** to travel agents on point-to-point trips . . . United Air Lines is distributing to pet owners a well-illustrated leaflet on **shipping their pets** via UAL in Tuttle kennels. Original print order of 25,000 has been doubled . . . Bob Six, president of Continental Air Lines, tells us that a couple of years ago he was playing with the idea of putting **lightweight plastic slot machines** on some of CAL's planes. Give the passengers something to do, and make a little money for the company. Idea was dropped because CAL's lawyers were afraid of it . . .

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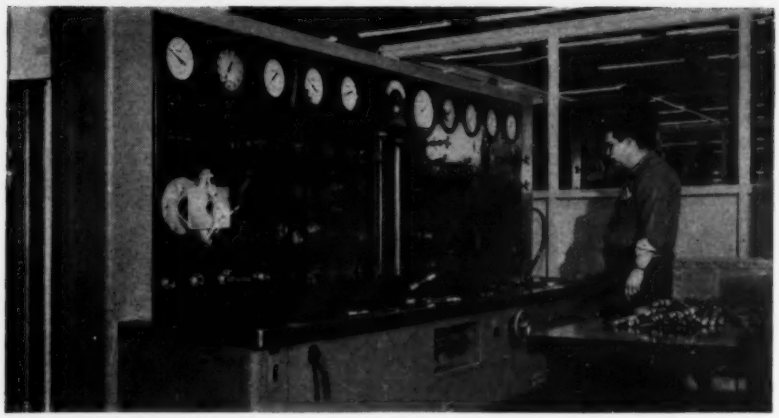
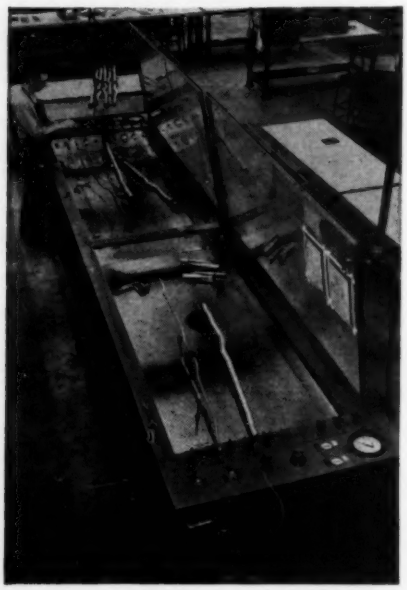
GREER TOPICS

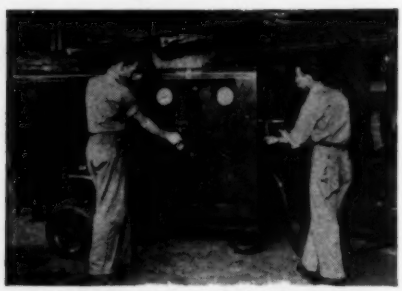
Important News of Aviation & Industrial Test Equipment



Greer Stationary Hydraulic Accessories Test Stand, shown here in Ford's Kansas City Aircraft plant, provides a shop type machine to fully check hydraulic system accessories including system pump at flow rates up to 20gpm and at pressures up to 3400psi.



Greer Dual Hose Tester, used for B-47 hose lines, checks from one to six hose lines or similar production components with pressures to 25,000psi in covered burst chamber.



Greer Portable Hydraulic Test Machine provides hydraulic test fluid for checking hydraulic systems of modern aircraft. Handles flows up to 20 gpm and pressures up to 3400psi.

How Greer Helps Ford

Greer Test Machines check complex B-47 components at Ford's Kansas City plant

This year is the fiftieth anniversary of the Ford Motor Company. Their entire history is one of quality products, economically produced. One of the reasons for Ford's extraordinary record has been its high standards of quality control.

To help maintain these high standards in the manufacture of aircraft components, Greer test equipment is at work in Ford's Kansas City aircraft plant. Complex B-47 components are put through rigorous inspection to determine their air-worthiness.

Walk into virtually any plant in the aircraft industry and you'll find Greer equipment at work. Most of the units are standard equipment ordered directly out of a catalog (yours on request). Other units were specially built to out-of-ordinary specifications by the famous Greer engineering department. These men are ready to go to work for you.

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People

MANUFACTURING

Ralph E. Jennings has been appointed executive vice president of Doman Helicopters, Inc.

Walter G. Bain has been named to the newly created position of executive assistant to the president of Republic Aviation Corp.

Hugh Gordon has resigned as chief maintenance engineer of British European Airways to assume the post of general manager of Saunders-Roe Helicopter Division.

Maj. Gen. Alden R. Crawford, USAF Ret., has been named general manager of Republic Aviation International. Crawford, who will make his headquarters in Lugano, Switzerland, will coordinate the manufacture of spare parts for the F-84's to be used by the member nations of NATO.

F. W. Borchers has been appointed general sales manager of the Bristol Company.

Frank Martin has been promoted from assistant to sales manager-commercial aircraft of the Cessna Aircraft Co.

Whitney Collins is now chief engineer of Continental Aviation & Engineering Corp.'s recently formed Gas Turbine Division.

Dan Gilmore has joined Chance Vought Aircraft Division of United Aircraft Corp. as chief tool engineer.

Nicholas Ricciardi has moved from purchasing agent of the parts department, California Division of Lockheed Aircraft Corp., to manager of the purchasing department of Lockheed's Georgia Division, in Marietta, Ga.

Vice Adm. John B. Moss, USN Ret., has joined Bell Aircraft Corp. as a consultant.

Roy Backman has been elected to the post of vice president of product sales of Pacific Airmotive Corp. Prior to his recent promotion, Backman was the company's sales manager.

Backman

Adcox

AIRLINES

Herman Adcox has been promoted from superintendent of passenger service to general traffic and sales manager for Pioneer Air Lines.

L. John Eichner has resigned as assistant cargo sales manager of Capital Airlines to accept the post of general

traffic and sales manager of Trans-Texas Airways.

R. L. O'Brien, formerly assistant to the general traffic manager, has been promoted to the post of sales superintendent of Canadian Pacific Airlines.

Stanley P. French, formerly schedules and tariffs supervisor for Allegheny Airlines, is now traffic manager for Alaska Airlines. French's former post has been taken over by **Burr Clark**, previously with Trans World Airlines.

Marvin L. Davis has been appointed system traffic manager of Continental Air Lines, filling the vacancy created by the resignation of **Edward Riederer.**

G. Jack Miller has been appointed assistant to the manager of Pan American World Airways' Miami Overhaul Base from his previous position as industrial engineer.

Neil B. Berboth has been named assistant general manager of California Eastern Airways.

William J. Naylor will join Northwest Airlines as assistant sales manager of the line's Continental Division on October 1. Naylor comes to NWA from Pan American World Airways where he was regional traffic and sales manager for central Europe.

Bennett King has been named staff assistant to United Air Lines' director of publicity, **R. M. Rummel.**

The following employes have recently completed 20 years or more of service in the aviation industry:

• **F. M. Sigafoose**, North American Aviation, Inc. Administration engineer, Los Angeles. 25 years.

• **John Maxian, Jr.**, North American Aviation, Inc. Chief electrical engineer, Los Angeles. 25 years.

• **R. A. Bussey**, Consolidated Vultee Aircraft Corp. Assistant treasurer, San Diego. 25 years.

• **C. L. Johnson**, Lockheed Aircraft Corp. Chief engineer, Burbank. 20 years

• **A. C. Ball**, United Air Lines. Captain, San Francisco. 25 years.

• **M. E. Goodyear**, United Air Lines. Staff assistant-ground services, Denver. 25 years.

• **A. K. Holzer**, United Air Lines. Foreman, San Francisco. 25 years.

• **M. E. Nelson**, United Air Lines. Flight dispatcher, Chicago. 25 years.

• **H. J. Schott**, United Air Lines. Quality control analyst, San Francisco. 25 years.

• **R. W. Brady**, United Air Lines. Captain, San Francisco. 20 years.

• **D. Chemello**, United Air Lines. Lead line mechanic, San Francisco. 20 years.

• **A. DeKeyser**, United Air Lines. Supervisor-building maintenance, Chicago. 20 years.

• **P. F. Goebel**, United Air Lines. Aircraft inspector, San Francisco. 20 years.

• **F. W. Hoy**, United Air Lines. Flight manager, Los Angeles. 20 years.

• **C. E. Joyce**, United Air Lines. Captain, Seattle. 20 years.

• **D. E. Longnecker**, United Air Lines. Flight engineer, San Francisco. 20 years.

• **J. Matthews**, United Air Lines. Flight manager, Seattle. 20 years.

• **E. D. Peak**, United Air Lines. District passenger service manager, Salt Lake City. 20 years.

• **C. L. Pettit, Sr.**, United Air Lines. Building and maintenance mechanics, Salt Lake City. 20 years.

• **S. A. Robinson**, United Air Lines. Supervisor-mechanical service, Honolulu. 20 years.

• **W. E. Slack**, United Air Lines. Flight engineer, Los Angeles. 20 years.

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Troubles Pile Up on U. S. Airlines

U. S. Airlines, rocked many times by financial difficulties and management shake-ups during its four-year history as a certificated all-cargo carrier, appeared to have reached the ultimate in trouble this month when:

• **CAB Enforcement Attorney Robert Burstein** filed a complaint with the Board requesting suspension or revocation of U. S.'s certificate because the line "is at the present time unable to inaugurate and conduct adequate service over its certificated routes."

• **The U. S. Air Force** threatened to withdraw the six C-46's it had leased to U. S. claiming it had not been paid approximately $30,000 in rentals due.

• **The Securities & Exchange Commission** required U. S. to revise a stock prospectus to reflect the new CAB enforcement action, a move which in itself could kill a stock offering of one million shares which U. S. considered necessary to future survival.

• **Fred A. Miller,** fourth president of the airline, resigned.

U. S. was certificated for all-cargo service along the east coast and in the general area west of the Mississippi in August, 1949. Its certificate bears an August, 1953, expiration. The service it has provided under its four different managements generally has been concentrated on a Miami-New York route.

Burstein, in his complaint, charged that U. S. has not operated its certificated routes for a "substantial period" prior to filing of the complaint. He cited numerous "intentional" instances of non-compliance with CAB regulations and a cease and desist order. His

Fred A. Miller

iner Ferdinand D. Moran has also recommended against the proposal. Complaint calls for a full investigation.

But either of the other two actions, an Air Force withdrawal of the U. S. fleet of C-46's or the SEC stock action, could bring an earlier end to the carrier than the CAB enforcement move.

Miller, former head of the nonscheduled line Air America, took over U. S. last November. He told AMERICAN AVIATION that his efforts to revive the airline hinged on the stock offering made this summer. But a "slow market," among other things, intervened.

The airline at press-time had not announced Miller's successor. It had not decided on any future plans. There was strong speculation that a merger of U. S. and Riddle Airlines, in the talking stage for months, might materialize.

Chicago-Seattle Non-Stop Service Studied

United Air Lines' long-standing fight to operate non-stop between Chicago and the Pacific northwest has been taken under advisement by the CAB. Opposed strongly by Northwest Airlines, which now has such non-stop authorization, United wants CAB specifically to lift a route restriction which requires a stop at Salt Lake City.

During recent oral argument UAL attorney John L. Lorch claimed "there is plenty of business for both airlines" and "the future progress of the northwest area in trying to compete for economic prestige with other west coast cities is at stake."

NWA counsel C. Edward Leasure and CAB's Bureau Counsel Francis H. McAdams, however, saw the United proposals as "mere duplication." Exam-

CAB Miscellany

Lake Central Airlines has asked CAB for a Chicago-Detroit local service route and simultaneous suspension of American Airlines at intermediates of Ann Arbor, Jackson, Battle Creek, Kalamazoo, and South Bend.

Trans-American Airways, one of the "North American" group, has applied to CAB for permission to operate under the name of "Air Bus, Inc."

Laurentide Aviation, Ltd., a Canadian carrier, has been granted a three-year permit by CAB for irregular-type trans-border operations between Montreal and various U.S. areas.

Air America, Inc., claims its use of that name constitutes no infringement on American Airlines and asks CAB to dismiss a pending American complaint.

CAB News

AS OF NOW.....

The future course of CAB's **New York-Balboa Case** now hinges on whether or not an examiner's report will be issued on the basis of new evidence submitted early this month. If such a report is permitted, as requested by Pan American, Eastern, and Panagra, it will come out about November 1. The case then could go back to the White House again for decision in December or January.

The **North American Airlines Enforcement Case,** in which hearings have been recessed since June 23, is now stalled by a Supreme Court petition filed by North American in which the carrier still seeks to enjoin CAB from resuming the hearings. Two other courts have denied similar petitions.

Hearings in the **Williston Basin Area Case** will get the three-city treatment as sessions will be held in Billings, Mont., Williston, N. D., and Washington, D. C. Case involves local-type airline service in the Williston area. First two hearings will be for the convenience of civic intervenors, with airlines presenting their cases in Washington.

RECENT CAB DECISIONS

• **National Airlines** and Delta-C&S Air Lines protest against Eastern Air Lines' use of Super Constellations in daylight coach service dismissed as not stating facts warranting CAB suspension.

• **American Airlines** turned down on motion for dismissal of investigation which contemplates possible certification of AA to serve Nogales, Arizona.

• **Economy Airways** authorized to continue prosecution of its case in Large Irregular Air Carrier Investigation over complaint of American Airlines. Denial of AA motion, however, is "without prejudice to renewal at end of hearings."

CAB CALENDAR

Sept. 28—Hearing in Ozark Air Lines Renewal Case. St. Louis, Mo. (Docket 5988 et al.).

Sept. 28—Hearing resumed in Williston Basin Area Case (Airline parties). Washington, D. C. (Docket 5777 et al.).

Sept. 29—Oral argument before the Board in Air America, Inc. Enforcement Case. Washington, D. C. (Docket 5766).

Sept. 30—Hearing in Bonanza Air Lines Renewal Case. Las Vegas, Nev. (Docket 5773 et al.).

Oct. 12—Hearing in Aerovias Sud Americana-North American Food Carriers Acquisition Case. Washington, D. C. (Docket 6245).

Oct. 12—Hearing in Short-Haul Coach Fare Investigation. Washington, D. C. (Docket 6098 et al.).

Oct. 19—Hearing in States-Alaska Service Case (Civic intervenors). Anchorage, Alaska. (Docket 5756 et al.).

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The J. I. Case Company, manufacturers of power farm machinery, have been flying experimental DME since December 1952 in one of the company's planes. Shown above are Elmo Halverson, Chief Pilot, Paul Johns, Pilot, and Cole H. Morrow, Chief Plant Engineer, looking at the DME antenna.

Mr. Morrow, who is also Chairman of The National Business Aircraft Association says, "When all the present DME ground equipment is installed and operating, the air-borne VOR and DME will provide business aircraft operators the most accurate and useful navigation aid that has ever been available."

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U. S. International Airline Traffic for July 1953

Airlines	Revenue Passengers	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor %	U. S. Mail Ton-Miles *	Foreign Mail Ton-Miles	Express Ton-Miles	Freight Ton-Miles	Total Ton-Miles Rev. Traffic	Available Ton-Miles Flown	% Available Ton-Miles Used	Revenue Plane-Miles	Scheduled Miles	% Scheduled Miles Completed
American	8,005	5,710,000	9,016,000	63.32	16,312	4,925	294	178,465	796,815	1,356,592	58.74	191,431	189,295	100.00
Braniff	3,005	6,737,000	16,153,000	41.71	68,179	8,748	....	101,199	930,514	2,229,124	41.74	365,174	365,298	99.97
Colonial	5,498	4,250,000	5,850,000	72.65	1,470	525	....	5,364	456,507	850,432	53.68	105,128	49,861	96.12
Delta-C&S	2,883	3,477,000	7,347,000	47.33	6,363	918	....	105,402	469,488	1,018,563	46.09	157,655	157,958	99.81
Eastern	16,322	24,883,000	30,917,000	80.48	47,117	....	....	44,186	2,659,810	4,226,378	62.93	506,604	348,204	99.54
National	10,197	4,310,000	8,522,000	50.57	5,004	....	1,625	34,530	478,452	1,143,006	41.86	146,101	146,824	98.87
Northwest	8,294	13,664,000	23,358,000	58.50	112,538	28,427	17,371	651,514	2,271,692	3,563,744	63.74	582,561	576,332	95.25
Panagra	10,958	11,914,000	21,085,000	56.50	29,385	28,620	....	257,595	1,621,825	2,821,255	57.49	502,715	493,375	98.54
PAA														
Latin Amer.	79,105	82,338,000	116,420,000	70.72	244,035	61,515	....	1,854,226	9,823,514	14,471,759	67.88	2,363,036	2,002,592	96.54
Atlantic	67,119	77,651,000	114,448,000	67.85	531,397	164,277	....	963,844	9,870,056	14,840,953	66.51	1,867,979	1,740,170	99.03
Pacific	13,692	44,172,000	63,313,000	69.77	385,093	103,268	....	638,471	5,804,508	9,719,373	59.72	1,138,264	1,119,104	99.87
Alaska	8,627	8,953,000	16,331,000	54.82	35,904	....	....	432,248	1,380,520	2,617,145	52.75	389,222	313,564	100.00
TWA **	17,237	41,850,000	54,072,000	77.40	299,226	94,142	....	417,203	5,183,685	6,979,462	74.27	1,083,473	1,648,685	64.20
United	5,922	14,706,000	19,348,000	76.01	51,115	....	....	47,514	1,586,966	2,354,030	67.41	352,018	352,018	98.64
TOTALS	256,864	344,615,000	506,180,000	66.10	1,833,138	495,365	19,290	5,731,761	43,334,352	68,191,816	63.55	9,751,361	9,503,280	92.40

* Mail ton-mile figure includes air parcel post. ** Low completion factor due to navigators' strike July 9-22.

NOTE: 1. Above figures include both scheduled and non-scheduled operations.
2. Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; Delta-C&S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

U. S. Domestic Airline Traffic for July 1953

Airlines	Revenue Passengers	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor %	Mail Ton-Miles **	Express Ton-Miles	Freight Ton-Miles	Total Ton-Miles Rev. Traffic	Available Ton-Miles Flown	% Available Ton-Miles Used	Revenue Plane-Miles	Scheduled Miles	% Scheduled Miles Completed
American	519,317	304,037,000	457,627,000	66.44	1,408,943	819,608	4,092,346	35,199,210	61,071,298	57.64	9,407,313	9,412,478	99.55
Braniff*	102,674	39,320,000	75,113,000	52.35	156,180	103,624	222,989	4,242,271	8,218,150	51.62	1,982,332	1,994,821	98.95
Capital	211,306	66,355,000	112,132,000	59.18	185,246	218,837	294,179	7,043,383	15,139,545	46.52	2,665,173	2,646,236	98.54
Caribair	11,417	953,000	1,554,000	61.33	900	....	1,345	89,168	161,338	55.27	62,510	53,123	100.00
Colonial	38,719	9,634,000	16,331,000	58.99	12,349	8,175	18,565	934,657	1,810,465	51.63	467,780	392,257	99.20
Continental	33,091	13,495,000	27,194,000	49.62	48,814	16,844	74,494	1,432,598	3,456,127	41.45	730,507	720,308	99.66
Delta-C&S	129,295	54,691,000	90,240,000	60.61	227,773	195,214	467,195	6,127,298	10,743,279	57.03	2,483,721	2,488,425	99.50
Eastern	381,296	180,749,000	313,564,000	57.64	466,487	293,750	571,026	19,592,653	41,819,518	46.85	5,727,356	5,646,756	99.50
Hawaiian	43,072	5,842,000	9,571,000	61.04	2,192	....	150,865	625,148	1,338,638	46.70	320,351	229,546	99.85
National	63,099	43,107,000	64,817,000	66.51	110,006	41,513	411,461	4,926,086	7,933,966	62.09	1,371,019	1,344,956	99.94
Northeast	62,618	12,532,000	21,620,000	57.96	12,203	11,525	27,333	1,184,837	2,130,147	55.62	710,492	713,222	95.06
Northwest	100,927	74,189,000	116,141,000	63.88	284,744	147,024	288,563	7,853,746	13,303,692	59.03	1,919,422	1,923,818	98.83
Trans Pac.	15,964	2,063,000	3,789,000	54.45	2,199	39	5,457	164,515	313,278	52.51	135,322	109,060	100.00
TWA	266,120	228,609,000	302,190,000	75.65	1,026,588	571,857	1,438,854	24,899,233	36,889,515	67.50	5,789,816	5,890,306	97.63
United	371,764	246,888,000	342,791,000	72.02	1,450,099	777,702	2,146,489	28,033,498	49,478,521	56.66	7,343,709	7,588,080	95.52
Western	78,292	35,231,000	55,959,000	62.96	141,071	66,920	100,076	3,671,472	6,294,263	58.33	1,293,332	1,291,553	99.36
TOTALS	2,428,971	1,317,695,000	2,010,633,000	65.54	5,545,794	3,272,632	10,311,237	146,019,773	260,101,740	56.14	42,410,155	42,444,945	98.34

* Braniff's figures do not include operations of local service route 106 operated by Braniff as result of Braniff-MCA merger.
** Mail ton-mile figures include air parcel post.

NOTE: Above figures include both scheduled and non-scheduled operations.

U. S. Local Service Airline Traffic for July 1953

Airlines	Revenue Passengers	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor %	Mail Ton Miles	Express Ton-Miles	Freight Ton-Miles	Total Ton-Miles Rev. Traffic	Available Ton-Miles Flown	% Available Ton-Miles Used	Revenue Plane-Miles	Scheduled Miles	% Scheduled Miles Completed
Allegheny	24,217	3,594,000	6,579,000	54.63	5,356	9,517	...	357,596	751,877	47.56	313,282	304,304	99.77
Bonanza	5,878	1,306,000	3,461,000	37.73	2,244	1,212	2,516	131,008	341,763	38.33	144,204	145,886	98.85
Braniff*	5,017	987,000	2,025,000	48.74	2,163	2,098	2,404	100,782	202,517	49.76	84,382	82,082	99.15
Central	3,132	496,000	2,962,000	16.75	2,636	919	2,268	53,214	374,798	14.20	156,166	155,961	99.86
Frontier	12,178	3,084,000	7,848,000	39.30	7,636	5,368	42,243	349,368	746,832	46.78	376,291	370,140	99.66
Lake Central	5,989	882,000	3,782,000	23.32	1,980	8,367	...	90,277	407,352	22.16	170,110	170,159	99.52
Mohawk	14,919	2,468,000	4,767,000	51.77	2,635	4,083	4,816	231,077	568,879	40.62	227,389	222,450	99.21
N. Central	24,179	4,418,000	9,064,000	48.74	9,148	14,707	...	430,897	1,033,241	41.70	430,505	442,300	97.09
Ozark	11,206	1,824,000	6,730,000	27.09	3,597	5,059	...	179,239	663,592	27.01	269,207	269,886	99.17
Piedmont	27,715	5,716,000	11,354,000	50.34	9,062	7,289	11,358	574,822	1,299,655	44.23	541,523	536,890	99.96
Pioneer	11,543	3,330,000	8,427,000	39.52	8,147	3,398	10,459	340,557	819,497	41.56	234,243	235,862	99.25
Southern	9,378	1,622,000	5,513,000	29.42	6,047	4,554	...	165,814	597,373	27.76	262,524	262,544	99.99
Southwest	18,880	3,830,000	6,378,000	60.05	6,560	3,740	10,319	385,782	701,268	55.01	249,466	221,561	99.49
Trans-Texas	8,661	1,836,000	6,950,000	26.44	7,877	4,234	8,422	195,561	794,294	24.62	330,715	330,876	99.88
West Coast	16,528	2,897,000	6,603,000	43.87	3,950	2,480	4,714	272,770	679,151	40.16	314,414	313,317	98.69
Wiggins	398	42,000	160,000	26.25	110	199	...	4,092	17,022	24.04	40,708	48,066	83.03
TOTALS	200,018	38,332,000	92,603,000	41.39	79,148	77,224	99,519	3,862,856	9,999,111	38.63	4,145,129	4,112,284	99.07
						Helicopter Services							
HAS	...	....	....	...	2,717	...	...	2,717	6,276	43.29	31,343	31,423	99.74
Los Angeles	...	....	....	...	4,947	...	...	4,947	14,086	36.12	31,347	32,219	97.30
N.Y. Airways**	103	2,000	11,000	18.18	4,547	...	212	4,925	13,557	36.33	34,253	36,414	93.08

* Figures cover operations of local service route 106 operated by Braniff as result of Braniff-MCA merger.
** New York Airways inaugurated passenger service July 8, 1953.

NOTE: Above figures include both scheduled and non-scheduled operations.

INTERNATIONAL AVIATION

Edited by Anthony Vandyk

INTERCOM

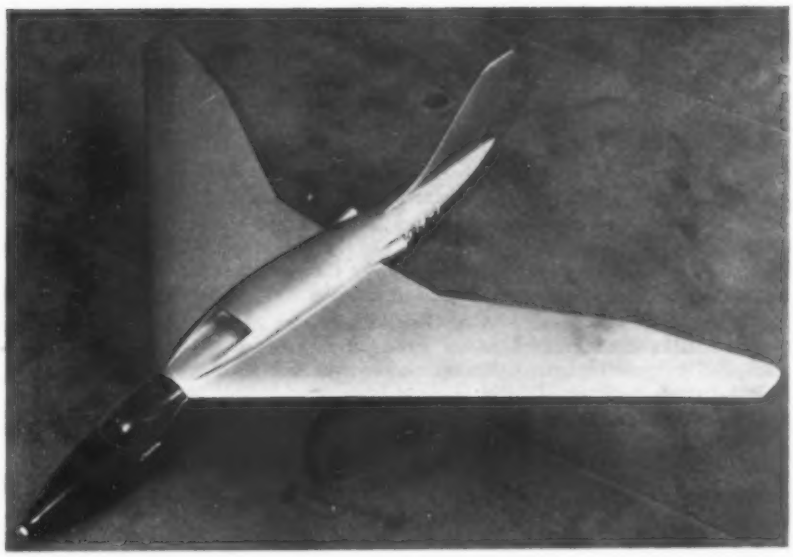
The answer to the oft-asked question, "What happened to the Douglas DC-1?" has been supplied by British European Airways after considerable research. The one and only DC-1 (subsequent aircraft had a two-foot longer fuselage and were designated DC-2) ended its career in Europe. Howard Hughes bought it from TWA in 1936 and sold it in 1938 to Viscount Forbes, who had the plane shipped to England but only used it for a few months before selling it to a French company. The DC-1 was subsequently sold to Spanish airline LAPE and it was in Spanish markings when it made a wheels-up landing just after taking off from Malaga in December, 1940. That was its last flight.

•

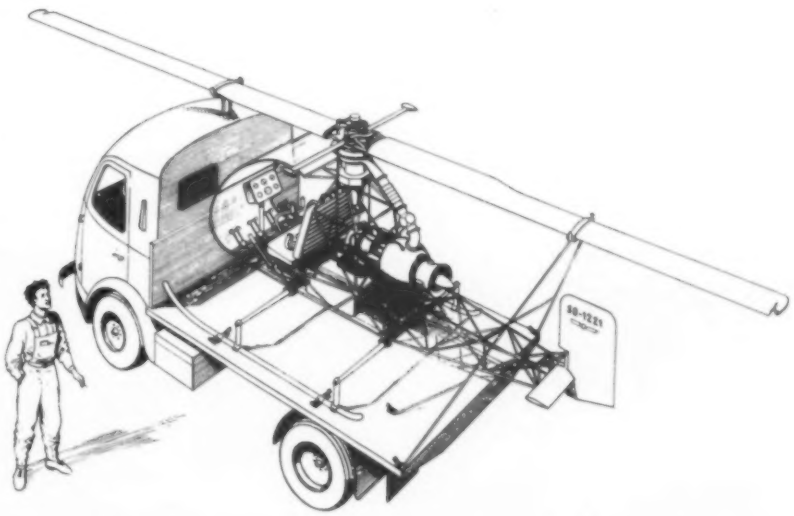
No airline with a sense of duty to the traveling public can afford to ignore the positive reduction in the fire risk which is provided by kerosene fuel, de Havilland states in rejecting suggestions that some advantage might be gained in using JP-4 (wide-cut gasoline) in civil jet aircraft. The company considers that JP-4 cannot be considered as suitable for commercial operation. Although experience has shown that the aircraft gas turbine will run equally well on either JP-4 or kerosene, there are many factors of comparison between the two fuels concerning safety, economy, and practicability which lead to the conclusion that kerosene is superior, de Havilland reports.

The allied air forces are now using JP-4 exclusively (kerosene was used by the USAF until 1950 and by the RAF until 1952) because insufficient kerosene would be available in time of war, but there is no indication that supplies of kerosene for civil aircraft will be inadequate to meet future requirements. Fuel expert A. R. Ogston of Esso Export Corp. reports that even if 500 turbine aircraft are in operation by 1960-62—and he considers this figure optimistic—the resulting fuel requirement of 125,000 barrels a day would be barely 0.8% of estimated total crude oil production. From the standpoint of a major oil company, he says, it is immaterial which particular fuel is supplied for jet transports.

Ogston is concerned, however, that the fuel adopted should be a single grade acceptable to all airline operators.



Short SB.4 Sherpa powered glider is being readied for its flight tests. It is intended for testing the isoclinic wing, which is designed to flex without loss of incidence due to torsion. To remove torsional load from the ailerons rotating wingtips (all-moving) are used. These also act as elevators and are expected to eliminate all chance of control reversal. The Sherpa flew as a glider but crashed a year ago and was rebuilt with two Turbomeca Palas jets. First flight has been delayed owing to the efflux scorching the tail.



SNCASO Djinn helicopter is capable of carrying a useful load equal to its own weight (about 600 pounds) and is seen as an extremely useful military vehicle costing half the price of current lightweight rotorcraft. It is propelled by compressed air jets.

INTERNATIONAL AVIATION

MANUFACTURING

SPAIN: Leading aircraft firm CASA made a profit of $330,000 in 1952. Its Cadiz plant may be sold to Germany's Dornier company. A model of a Dornier-designed flying boat is being tested by Spain's INTA research establishment.
FRANCE: Dassault is developing a folding-wing version of the Mystere IV for the French Navy, an enlarged Mystere 4 (similar in a sense to NAA's F-100 which was developed from the F-86), a delta lightweight fighter scheduled to fly next year, and various pilotless aircraft.

SNCASE has completed the mockup of its SE 210 Caravelle jet transport and is working on the prototype, which is scheduled to fly in 1955. Company's Cannes plant is working on air-to-air and ground-to-air missiles.

Second prototype of SNCASO's Trident high-speed experimental aircraft crashed on its second flight, injuring test pilot Jacques Guignard. Rocket power was not used and the crash is reported to have been caused by loss of power from the wingtip-mounted Turbomeca Marbores.

Testing of the SNECMA Vulcain turbojet on an Armagnac four-engine transport will involve slinging the engine in a pod under the fuselage. Seven other Armagnacs are to be used on a military airlift operation between France and Indo-China, subject to government approval.
BRITAIN: Both the Rolls-Royce RA.7 and RA.14, although dimensionally interchangeable with earlier Avons, are actually virtually new designs with similar combustion chambers and twin-spool compressors.
CANADA: First production Canadair-built Orenda-powered Sabre fighter is now flying. This model is gradually being phased into the Canadair F-86E (with J47) line which is currently at the 30-a-month level.

First of 650 Avro-Canada CF-100 all-weather fighters is due off the line this month. Plane has three rocket pods and a removable gun pack.

MILITARY

BRITAIN: Deliveries of production Vickers Valiant jet bombers to the RAF are expected to start soon. RAF will also get a photo-reconnaissance version of the plane.
FRANCE: Ten pre-production Dassault Mystere IVA's (powered by the Hispano-Suiza Verdon) have been ordered by the French Air Force.

EGYPT: Negotiations are taking place between the Egyptian and Czechoslovak governments for the supply of MiG-15's, built at Letov's Prague plant, to the Egyptian Air Force.

NETHERLANDS: The Fairey Gannet and Short Sea Mew are being considered for procurement by the Dutch Navy as replacement for its TBF Avengers.

TRANSPORT

PORTUGAL: Transportes Aereos Portugueses is still undecided between the Super Constellation and the DC-7 (overwater version) for its projected service to South America.

GREECE: TAE National Greek Airlines is selling six of its 16 DC-3's; Seaboard & Western has bought two. Greek carrier may buy four Convair 340's.

SWITZERLAND: Swissair is reported to be negotiating with KLM to buy more Convair 240's. It recently bought two from the Dutch airline to supplement its original four. Swissair is also interested in buying Civil Air Transport's five ex-Chinese 240's.

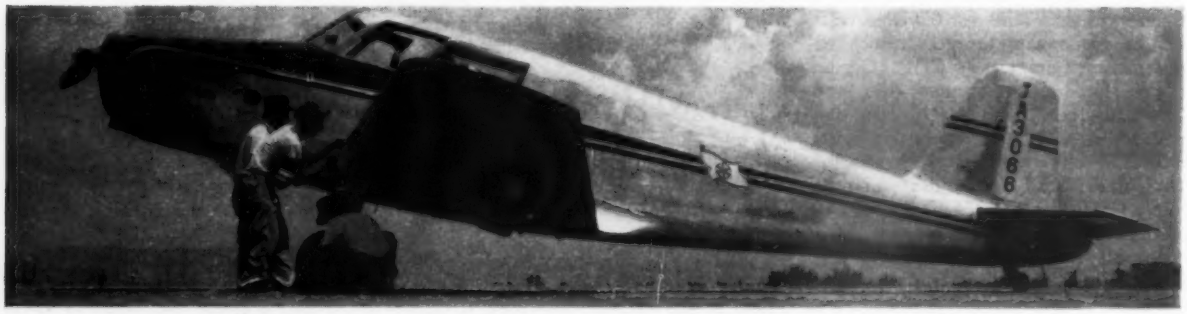
SCANDINAVA: SAS has sold two DC-4's to Avianca, Colombian airline, at over $600,000 each. It has also sold a DC-3 to Canada's Maritime Central Airways.

NETHERLANDS: KLM has taken delivery of the first of 12 Convair 340's. Dutch airline will introduce Super Constellation service to South Africa on October 3 with the fastest schedules to Johannesburg ever operated by piston-engine planes.

BRITAIN: BEA will return to the London-Lisbon route on October 6 with a weekly Viscount first-class flight. BOAC will continue to serve the Portuguese capital as an intermediate on its South American route.

Hunting will not inaugurate its projected services to Hamburg, Copenhagen, Oslo, and Stockholm because of lack of IATA approval for the proposed fares. The independent has temporarily suspended its Newcastle-Glasgow domestic service.

CANADA: Mont Laurier Aviation has been purchased by Boreal Airways for $200,000. The consolidated company now has a fleet of 12 planes for operations in Northern Canada.



Kawasaki's First postwar aircraft, the KAL-1 liaison plane powered by a 260-hp Lycoming, is now undergoing its flight tests. A trainer version, the KAT-1, is expected to fly later this year. The KAL-1 grosses 3320 pounds, has a useful load of 1207 pounds, and cruises at 167.5 mph. Range is 1000 miles.

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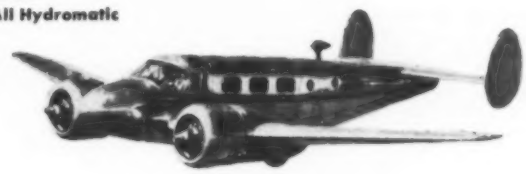

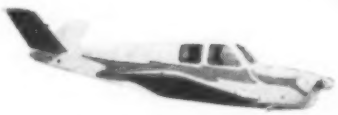

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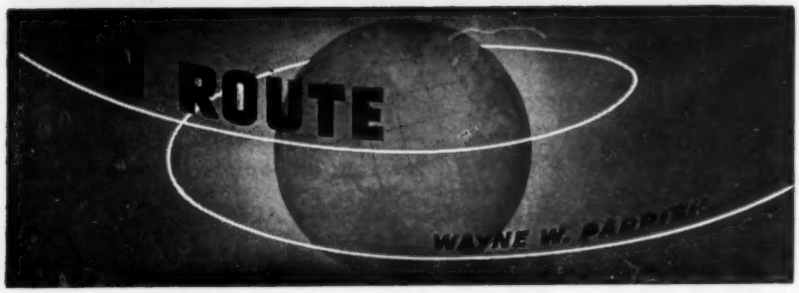

More About Tangier. As I said before, Tangier is unique. Where else, pray tell, could I walk in on a guy an hour after he had bought a bank? Maybe **you** folks are right chummy with bankers, but the state of my pocketbook is such that my relations with the banking business are both infrequent and casual. I may be greeted by a clerk but bank presidents don't exactly shine up to me as a major customer.

But not in Tangier. I found I was welcome. I even opened an account. Nothing in it, I might add, but in Tangier you don't necessarily have to put down any dough. They just wait until you get some.

Here's what happened. While in Paris I mentioned to **Jim Nolan,** TWA's wide-awake and intelligent public relations guy (wotta plug!), that I was bound for Tangier. His eyebrows raised immediately and I thought to myself, boy oh boy, Nolan knows a couple of babes and here come some addresses.

Banker Friend. Nothing like that; I should have known better, but Nolan did come forth with the flash that he knew a banker down there and I should call on him. He gave me his name as **Hermann K. Brann** and his address as the Moroccan Banking Corporation, 23 Rue Pasteur. Nolan said he was an American and a good friend. So I dutifully wrote down the glad tidings and said I'd look him up.

I could have added that bankers and I have a great common interest and that is money, except that bankers always seem to have some and my attachment is pretty largely academic. I'm always looking at the stuff and wondering where it comes from. I wouldn't last long in the banking business, because I believe in putting that green stuff to work and I'd probably forget that some of it belonged to other people.

So I arrived in Tangier by Air France one afternoon, as I told you before, and after being wakened at the El Minzah Hotel by donkeys braying in the old Arab section nearby, I had a leisurely breakfast and went out to size up the main street. At the main intersection where three arteries come together there are three cafes with tables on the sidewalk and I walked on eastward in the brilliant sunshine looking in the shop windows and being somewhat amazed by the quantity of American and European goods on sale.

I Make a Call. Before I knew it I found myself staring at a building with the number "23" on it and "Moroccan Banking Corporation" in handsome letters above. I got out my notebook and sure enough, here was my friend's friend's bank. Well, nothing to lose. Might as well pop in and see what happens. Nothing wrong with trying to act like a big depositor.

So I entered and walked up to the railing behind which a couple of girls were typing and asked if Mr. Brann was in. Yes, he was, and could I give my name. I did better. I pulled out one of my business cards which I have occasion to use about twice a year, and one of the gals took it into an office in the rear.

In a moment she comes out and asks me to go to the rear office, Mr. Brann would be glad to see me. So I walked back and here was a guy who certainly looked like an American and he put out his hand and said have a seat and I said he didn't know me from Adam but that a friend of his by the name of Jim Nolan said I ought to look him up.

Fast Guy Brann. "Hell, I know you, and I know your magazine," he said, and from then on the conversation moved at about 2000 miles an hour, which is Brann's customary speed, and this was the beginning of a very enjoyable acquaintanceship in this northwest corner of Africa with a very engaging guy.

Engaging is a mild understatement. He had just bought the bank an hour before I arrived and he and his partner, a Britisher, were busy signing papers and completing what few formalities there are to buying a bank in Tangier.

This guy Brann, I discovered, was an air inspector for the U. S. Air Force during World War II and in no time at all I found out we had a host of mutual friends and acquaintances in aviation. He owns and flies a Luscombe, I think it is, and has banking connections all over the world and keeps on the move most of the time. He pops ideas so fast he has to set up traffic control to avoid collisions, and his mind clicks almost as fast as these new calculating brains I read about.

Other Habitués. So in the four days I was in Tangier I spent a fair amount of time with Brann and his partner. One night down in the Arab quarter we went to an odd-looking restaurant that I wouldn't have ventured into alone for all the tea in China, but it turned out to be pretty good and the food was actually delicious and spiced with some hot stuff that would have choked Mount Vesuvius to shame.

I also met some other intriguing guys there. One I called **"The Mad Pole,"** an intriguing Pole who (he said) had been in a Russian camp in Siberia, escaped to the Middle East, joined the Western Allies in their push against the Nazis through North Africa and on into Italy, where, in time, he married an Italian gal and this, he says, was the greatest mistake of his life for several reasons.

One, marriage isn't for him—he wants to play the field and when he isn't busy at that he's busy boasting about it—and second, by marrying an Italian he stripped himself of all soldier's privileges because we were at war against Italy.

So The Mad Pole is waiting in Tangier for a visa to come to the U. S. A. and meantime is living by his wits, but with a very winning smile he'll get along somehow. Another guy there, an American by the name of **Fred Nissle,** is doing financial writing for American publications and drawing up tourist promotion plans for Tangier and seems to be living the life of Riley.

Arab Feast. The first night in Tangier I went with Nissle and The Mad Pole to an Arab feast out along the Atlantic about 10 miles from town and it was one of the weirdest things I've seen in a long time. I never did find out what particular feast these thousands of Arabs were celebrating, but they were camped out in a wooded area adjoining the beautiful wide beach and eating a goshawful assortment of odd foods and playing strange musical instruments and playing games or just sitting around talking. The area was lighted by acetylene and gas lights and fires, and what with the robes and headdresses of the Arabs the sight was quite unreal.

I never discovered whether it was legend or fact but rumor has it that during this particular feast-time the Arab women, who are very much under subservient control the rest of the year, are inclined or permitted by tradition to disport themselves with husbands other than their own on the beach and if any children result they simply blame it all on the full moon.

As I say, my researches didn't extend far enough to prove this one, but the whole idea has been written up before and the story goes that it's all on a mass scale. I guess I failed you readers on this one.

Gals With Ceilings. Before I finish with Tangier I must tell you about one item for which Tangier has established a well-enforced price ceiling. Down in the old Arab quarters there are a number of houses of a rather old and famous sport, and each is identified by a red light and at the very end of one winding, narrow lane is Le Chat Noir, the Black Cat, which seems to be about the best known.

Is is populated by about 15 girls, mostly Spanish, all garishly dressed, and although they'd never win any beauty prizes they were a little above the South American standard, for whatever that small concession is worth.

But the established ceiling price for their pleasures is 60 Spanish pesetas. Since the peseta was selling at 43 to one U. S. dollar, you can see that the top price is not exactly high, about $1.50. I was told that if any gal is caught asking for more, she's booted out of Tangier fast. I suppose that's one way to control inflation. Wotta life!

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FAIRCHILD POWER for the RYAN FIREBEE

JET POWER to send a remote-controlled, high-altitude missile streaking across the sky at near-sonic speeds called for a new concept in powerplant design.

Fairchild met the challenge with the J-44 turbojet engine. It had to be extremely compact—yet provide more thrust than any engine of its size ever developed. It had to be expendable for warfare—yet quality-built for frequent re-use in research and training after parachute recovery.

In one application recently revealed, Fairchild's J-44 provides the power for the Firebee, a target drone with fighter plane performance, made by the Ryan Aeronautical Company.

TIME WILL TELL of the expanding role in the nation's guided missiles program, in light aircraft and as a supplementary powerplant in large aircraft of this engine concept that *had to be different* . . . another example of the design, development and production facilities of Fairchild fulfilling specialized power requirements.

J-44 SPECIFICATIONS

Announced thrust	*1000 lbs*
Weight	*300 lbs*
Length	*72 inches*
Diameter	*22 inches*

ACCESSORY SECTION containing essential controls, is quickly removed and replaced without special tools.

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News at Deadline

Lockheed Confirms Prototype Contract

Lockheed Aircraft has confirmed the report that it has received an Air Force contract to build prototypes of the XF-104. Two prototypes will be built.

The only detail released was that the aircraft will be a piloted jet, designed to maintain air superiority in a limited area.

Australian National Buys NAL DC-6's

Australian National Airways has bought two DC-6's and two spare engines from National Airlines for "nearly $2,750,000 cash." Delivery is scheduled for December 1. ANA has also placed an order with Douglas Aircraft Co. for two additional DC-6 type aircraft for delivery in February and March, 1955. National will replace the DC-6's with DC-7's.

ANA crews will come to the U.S. to fly the DC-6's to Australia, and the carrier plans to have them in domestic service by Christmas. NAL will convert the two planes from their present high-density configurations to two-and-two seating for 52 passengers, plus aft lounge with six seats. The DC-6's are the first pressurized aircraft bought by ANA and will be used to compete with the Convair 240's (and, next year, Viscounts) of Trans-Australia Airlines.

Mail Experiment Starts Week of October 5

Postmaster General Arthur Summerfield announced that first class mail by air experiments will start between New York-Chicago and Washington-Chicago during the week of October 5, and "possibly sooner." The CAB on September 21 approved the Post Office-proposed rates for the route.

'Flying Saucer' Viewed By R & DB Officials

A disk-shaped fighter said to be able to take off vertically and operate in the Mach 2 range has been inspected by top Air Research and Development Command officials at the plant of A. V. Roe, Ltd., in Toronto.

Baker Says National Undecided About Comets

G. T. Baker, president of National Airlines, says that while NAL has had a "continuing interest" in the British Comet jet transport for the past four years, no decision has been reached on buying the airplane and "there is nothing hot about it today."

Newspaper reports from London have quoted Robert E. Wieland, NAL vice president, as stating that NAL was negotiating for purchase of Comet II's and III's and that "the deal should go through." He was reported as stating that the company would buy three Comets, "to be followed by nine more."

Details on Engine Cuts To Come from the Field

Reaction in the industry to recent Air Force announcement of cuts in the engine production program (see page 13) has been slowed by the general nature of the statement by AF officials. New engine schedules have not yet been completed, and details will come from engine contractors in the field, rather than from the Pentagon, according to Defense Secretary Charles E. Wilson. As many as 6000 engines may be cut.

One of the second sources affected, Nash Works, in Kenosha, Wis., reports that it expects no further cutbacks, since it has revised its schedules over the course of the past few months and is already working on a reduced program.

NATO Aircraft Program Revealed

NATO plane production plans involve European construction of 1725 aircraft at a total cost of more than $582 million. Breakdown is as follows:

- **Great Britain:** 250 Vickers-Supermarine Swifts for the United Kingdom ($70 million); 460 Hawker Hunters for the U.S. ($140 million); 112 Hawker Sea Hawks for the U.S. Navy ($13 million).
- **Italy:** 50 North-American-licensed F-86K's to be assembled by Fiat for the U.S. ($22.5 million).
- **France:** 225 Dassault Mystere 4A's for the U.S. ($86.5 million); 150 Mystere 2's for the French Air Force, plus an undisclosed number of 4A's ($91 million).
- **Belgium-Netherlands:** 112 Hawker-licensed Hunters for the U.S. ($42 million); Belgium will produce 64 of these, Holland the remaining 48. The two countries have also ordered 348 Hunters for themselves ($117 million).

'3 and 8' Rule Dies

The end of a two-year court fight over limitations on the number of non-scheduled airline flights came as the CAB struck the controversial "3 and 8" regulation in its entirety. Legal action had kept the rule from becoming effective.

Westinghouse J40 Largely Wiped Out

Westinghouse Electric Corp. has received orders from the Navy Bureau of Aeronautics to stop development work on its large J40 jet engine, and concentrate on the J46. Westinghouse is still scheduled to deliver some early-number J40's, although all orders for advanced models have been cancelled.

Thrust rating of the J40 was never officially given, but some advanced versions reportedly developed over 10,000 pounds.

Four Carriers Agree to Fly First Class Mail

Four scheduled carriers have agreed to carry first class mail at special rates during a one-year experiment being conducted by the Post Office Department (see page 34). American, United, TWA, and Capital have all agreed to participate.

Capital expressed serious misgivings about the rates, which are 18.66¢ per ton-mile New York-Chicago and 20.04¢ per ton-mile Washington-Chicago, raising the question of whether the rates will be "reasonably compensatory" and whether there will be diversion from present airmail services.

Lee Deplores Bonanza-Southwest Merger Failure

The trend toward higher mail pay rates for local service airlines is a disappointment to CAB Member Josh Lee, ranking Democratic member of the agency and a staunch local service advocate. Lee pronounced himself par-

ticularly unsympathetic to an increased mail rate for Bonanza, for which other Board members recently voted annual pay of $947,803.

Asserting that the failure of Bonanza and Southwest to merge does not constitute "economical and efficient management," Lee said "I cannot agree to the rate because in my judgment this increase . . . constitutes an unnecessary burden on the public treasury."

Conner Air Lines Asks Two-Year Exemption

An exemption to conduct operations which allegedly do not require a certificate and do not conflict with certificated services has been requested by Conner Air Lines, Miami, Fla. The irregular carrier said it would not operate more than 14 flights in either direction between any two points during any period of four successive calendar weeks, except for charters, and that its fares would not be less than "the lowest effective certificated aircoach fares (between points receiving certificated coach service) for the same type aircraft, or more than 10% less for smaller or different type aircraft."

Japan-Lockheed Link

A technical link between Lockheed Aircraft and two Japanese firms, Kawasaki Machine Industry Co. and Kawasaki Gifu Works, Co., is believed to be imminent. A team of Lockheed specialists is reportedly in Japan for the purpose of arranging financial details as well as exploring the possibility of selling aircraft to the Japanese National Safety Forces.

Recaptured Airport Funds Frozen

Some $2½ million in "recaptured" Federal-aid-to-airport funds and funds not yet obligated has been frozen by the Commerce Department pending completion of a current study of the entire program. An additional $1½ million, recaptured at the end of fiscal 1953, was diverted by Congressional authorization to administrative purposes.

Drop Dallin Contract

J. Victor Dallin, who has been serving as Philadelphia's airport technical adviser since his dismissal last February as chief of the city's bureau of aeronautics, has been informed that his contract will not be renewed. He has announced no future plans.

Non-Sked Income Rose 117% in 1952

The 54 large irregular carriers took in transportation revenues of $71.4 million during 1952 in the process of flying 675,000 passengers over 1.25 billion passenger-miles, according to the Air Transport Association.

The irregulars' income before taxes increased 117% over their 1951 figure; income of the scheduled carriers fell off half of one per cent during the same period.

All First Class by Air at 5c Rate?

Five cent first class mail service for non-local deliveries, with the bulk of the mail travelling by air, is under consideration by the Senate Post Office Committee's Advisory Council, according to Sen. Frank Carlson, (R., Kansas), chairman of the committee. The six-cent rate for air mail would presumably be discarded.

The plan was presented to the council by Dr. Myles Robinson of the ATA, where it has been under consideration for some time.

IMATA Asks Plane-Load Lots in PO Experiment

Shipment of first class mail by air in plane-load lots is seen by the Independent Military Air Transport Association as the only alternative to what it terms a "dribble system" using only the space available on scheduled flights. IMATA applied on behalf of its members for the necessary CAB authority to participate in the Post Office experiment, offering rates equal to or lower than those proposed by the PO.

BOAC Reports Year's Deficit of $290,850

BOAC reports a deficit of $290,850 for its 1952-53 fiscal year (ended March 31, 1953) as contrasted with a net profit of $770,000 for the previous year. Operating profit of $290,850 became a deficit as the result of payment of interest on issued capital.

Total revenue was $101,238,421, 7.7% above the previous year. Output increased by 20 million to 215 million capacity ton-miles. Operating costs increased from 45.3 to 46.8 cents per capacity ton-mile. Load factor dropped from 65.7% to 64.5%.

Two Hughes Officials To Set Up New Firm

Two Hughes Aircraft Co. officials, Dr. S. Ramo, vice president for operations, and Dr. Dean E. Wooldridge, vice president for research and development, have resigned to establish an engineering firm.

The new company, to be known as the Ramo-Wooldridge Corp., will concern itself with research, development, and manufacture in electronics and guided missiles.

Air Force Team Examines Cessna XT-37

An Air Force inspection team has viewed a mock-up of the Cessna XT-37 intermediate trainer and reported itself "generally pleased" with its evaluation, which is still in progress. It was noted that the twin-jet trainer with side-by-side seating should "fill AF training requirements right down the line."

Cessna won a contract in January for building the mock-up in competition with eight companys submitting fifteen designs. At that time there was some dissention within the AF regarding use of a twin-engined plane in early training, and with the selection of Turbomeca Marbore 900 pound-thrust engines. The French-designed jets, never before in mass production, are to be supplied by Continental Motors Corp., as the J69.

Lockheed to Move T-33 Work to Palmdale

Lockheed Aircraft Corp. plans to begin moving final assembly and production flight work on the T-33 jet trainer to the new jet center at Palmdale, Calif., next spring, if the Air Force approves. Construction is now in progress on three buildings which are scheduled for occupancy in June.

If approved by the Air Force, the move will involve the transfer of several hundred employees from Lockheed's B-9 plant at Van Nuys.

Courtlandt S. Gross, executive vice president of Lockheed, said it was too early to tell how much or what type work might stay at Van Nuys. Lockheed has had its F-94C flight test facilities at Palmdale for several months. Air Force cutoff of this plane will end production on the F-94C sometime next spring.

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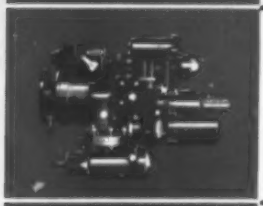
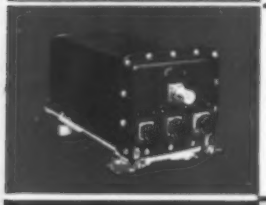


FUEL METERING UNIT Electrically controlled, this unit meters fuel to the engine in accord with signals from the electronic control.



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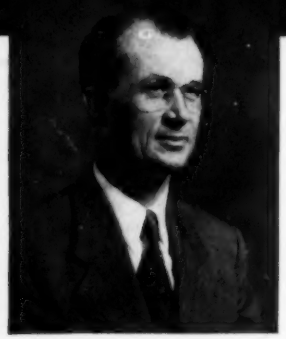

HOLLIS WILLIAMS, head of United Air Lines' engine overhaul. His maintenance shops at San Francisco are models of efficiency. Mr. Williams is a great booster for *Texaco Aircraft Engine Oil.*

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